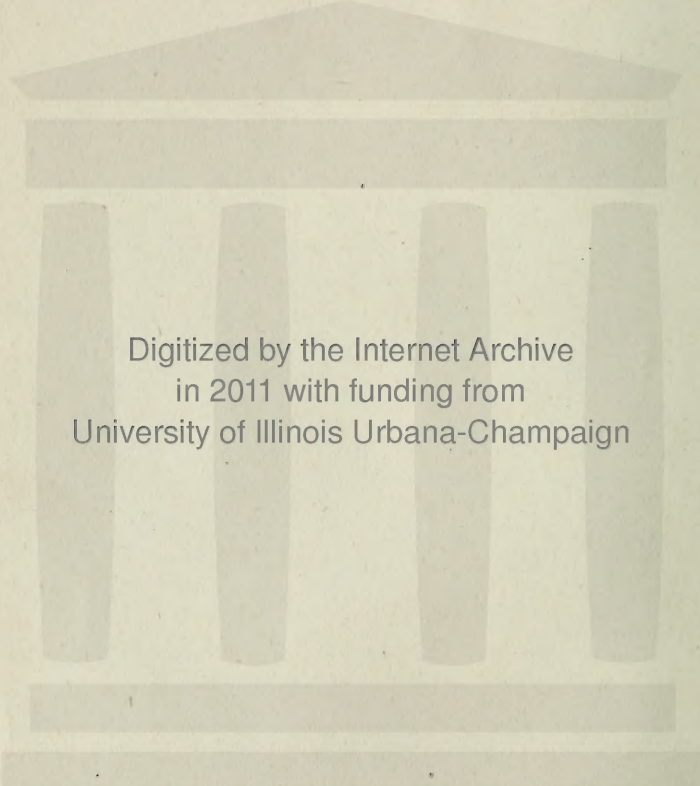


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University of Illinois

ANNOUNCEMENT OF COURSES

SEPTEMBER, 1914

Directions for Registration
Requirements for Graduation
Description of Courses

URBANA
PUBLISHED BY THE UNIVERSITY
SEPTEMBER, 1914

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CHARLES MAXWELL MCCONN, A.M.....	321	Natural History Building
<i>Bursar</i>		
OREN ELMER STAPLES.....	323	Natural History Building
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THOMAS ARKLE CLARK, B.L.....	330	Natural History Building
<i>Acting Dean of Women</i>		
MARTHA JACKSON KYLE, A.M.....	102	Woman's Building
<i>Adviser to Foreign Students</i>		
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<i>High School Visitor</i>		
HORACE ADELBERT HOLLISTER, A.M.....	209	University Hall
<i>Director of Physical Training for Men</i>		
GEORGE A. HUFF.....	1	Gymnasium
<i>Director of Physical Training for Women</i>		
GERTRUDE EVELYN MOULTON, A.B.....	110	Woman's Building
<i>Professor of Military Science</i>		
Major FRANK DANIEL WEBSTER, U. S. A.....	108	Engineering Building

KENDRIC CHARLES BABCOCK, Ph.D., LL.D., <i>Dean</i>	305	University Hall
GEORGE HENRY MEYER, A.M., <i>Assistant Dean</i>	305	University Hall
<i>Courses in Business Administration</i>		
DAVID KINLEY, Ph.D., LL.D., <i>Director</i>	109	Commerce Building
NATHAN AUSTIN WESTON, Ph.D., <i>Assistant Director</i>		
.....	103	Commerce Building
<i>School of Education</i>		
WILLIAM CHANDLER BAGLEY, Ph.D., <i>Director</i>	203	University Hall
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GENERAL DIRECTIONS FOR REGISTRATION

To Every Student:

You should at once look over the HEADINGS, at least, of ALL the paragraphs, numbered 1-26, which follow. It is certain that one or two of them, and probable that several others, are of vital importance to you individually at this time.

1. *New Students without Permits to Register*

A new student who has not yet secured a *permit to register* should proceed at once to the Registrar's office, 321 Natural History Building, taking with him his credit statements from all former schools (high school, academy, normal school, or college).

EXCEPTIONS

The foregoing direction applies to all new students without permits except:

- (1) GRADUATE STUDENTS—see page 68.
- (2) LIBRARY SCHOOL STUDENTS—see page 66.
- (3) APPLICANTS FOR ADMISSION AS "SPECIAL STUDENTS"—see paragraph 10
- (4) STUDENTS DROPPED FROM OTHER INSTITUTIONS—see paragraph 8.

2. *New Students with Permits to Register*

A new student who has already received a permit to register need not go to the Registrar's office, but will receive his study-list, together with further detailed instructions, at one of the following points, according to the college or school which his permit entitles him to enter:

College of Liberal Arts and Sciences, including Courses in Business, Ceramics, and Chemistry, and Preparatory to Medicine—opposite the main entrance of University Hall.

College of Engineering—opposite the main entrance of Engineering Hall.

College of Agriculture—opposite the main entrance of the Agricultural Building.

School of Music—Room 202, University Hall.

College of Law—Room 206, Law Building.

Library School—Room 320, Library Building.

Graduate School—see page —.

3. *Former Students in Attendance Last Semester*

A former student in attendance the second semester of the year 1913-14, and in all respects in good standing (see paragraph 5), should call for his study-list at one of the points mentioned in paragraph 2, according to the college or school in which he is enrolled.

4. *Former Students Not in Attendance Last Semester*

A former student not in attendance the second semester of the year 1913-14, but in all respects in good standing (see paragraph 5), must first secure a permit to re-enter, if a man, from the Dean of Men, if a woman, from the Dean of Women, and must then obtain a study-list at the Registrar's office.

5. *Former Students Not in Good Standing*

A former student, whether or not in attendance the preceding semester, if not in good standing, either—

(a) Because he has been in attendance a year as a *conditioned freshman* and has not cleared off entrance conditions; or—

(b) Because he has been registered for two years as a *special student* without matriculating; or—

(c) Because of *unsatisfactory work*; or for other reasons, may not register except upon the recommendation of the faculty of his college and with the approval of the Council of Administration, evidenced by a permit from the Secretary of the Council. Such a student should go first to see the dean or the assistant dean of his college.

6. *Students Changing Colleges or Courses within the University*

A student who desires to transfer from one college of the University to another college of the University should (1) secure from the dean of the former college a statement of his record therein; (2) secure from the Registrar a statement of his entrance credits and a study-list, and (3) submit these papers to the dean or assistant dean of the college which he wishes to enter.

Any student who wishes to transfer from the course in which he was registered the last semester to another course in the same college should consult the dean or the assistant dean of his college.

7. *Students with Advanced Standing*

A student transferring from another university, a college, or a normal school should submit his credits from that institution, or his estimate of advanced standing, if he has already obtained an estimate from the Registrar, to his adviser when consulting the latter about his course. Then, whether he has already had an estimate made or not, he should call between October 1 and October 15 at the Registrar's office to file a formal petition for transfer of credits. For the rules governing such transfers see the "Regulations for the Guidance of Undergraduate Students," paragraphs 48-57. It is impossible for the Registrar's office to make up estimates of advanced standing on the registration days.

8. *Students Dropped from Other Institutions*

A student who has been dropped from another college or university, either for unsatisfactory scholarship or for disciplinary reasons, may be admitted to the University of Illinois only on the recommendation of the college which he desires to enter, approved by the Council of Administration. A student in this case should first see the dean or the assistant dean of the college of his choice and learn in consultation with him whether or not it is probably worth his while to file a petition.

9. *Foreign Students*

Students from foreign countries should consult first the Adviser for Foreign Students, Room 214, Lincoln Hall.

10. *Special Students*

Persons over twenty-one years of age may be admitted as special students, provided they secure (1) the recommendation of the professor whose work they wish to take, and (2) the approval of the dean of the college concerned. They must give evidence that they possess the requisite information and ability to pursue profitably, as special students, their chosen subjects, and must meet the special requirements of the particular colleges in which they wish to enroll.

A special student is not matriculated and must pay a tuition fee of \$7.50 a semester in addition to the regular incidental fee of \$12.00 a semester.

No one may enroll as a special student in any school or college of the university for more than two years, except by special permission, application for which must be made through the dean of the college.

A person registered as a special student in one college and desiring to take a course in another college of the University must obtain the approval of the dean of the latter college.

A person desiring admission as a special student should first see the dean or the assistant dean of the college he wishes to enter (see the directory on page 4).

11. *Persons Connected with the University*

All persons connected with the University, other than registered students, if they attend any university class *for credit*, must register and file study-lists. Every such person must also pay a fee of \$7.50 for each study each semester. (See paragraphs 1-4 above.)

12. *Military and Physical Training for Men*

(a) The Requirement in Military

All male students, citizens of the United States, except (1) students of the College of Law, (2) students over twenty-five years of age when entering the University, (3) students entering the University with junior standing, and (4) students who have had two years of military work at other institutions having a United States army officer on duty as professor of military science, must register in military on entering the University, and, unless properly excused, must take the full course therein, whether they intend to graduate or not. To have any credits received for military work count for graduation, the full course must be taken. The classes of students excepted above may take military work if they so desire, by registering for it.

After registering in the military department, students physically disqualified, such disability to be certified by a reputable physician, approved by the Council of Administration, may be excused from military work by petition submitted through the military office.

BOTH FRESHMEN AND SOPHOMORES have drill (*Military 2a-2b-2c-2d*) one and one-half hours on one day each week (Monday, Tuesday, Wednesday, or Thursday) until March 15; after that date, three hours each week (one and one-half hours each on Monday and Wednesday, or, if the weather does not permit drill on either Monday or Wednesday in any week, then on Thursday of that week).

FRESHMEN also attend recitations in military science (*Military 1*) one hour a week during the second semester.

SOPHOMORES WHO ARE SERGEANTS are required to take *Military 3a-3b* (Advanced Theoretical Instruction).

JUNIOR AND SENIOR COMMISSIONED OFFICERS must *register* for both *Military 2c-2d* (Drill) and *Military 3a-3b* (Advanced Theoretical Instruction).

(b) The Requirement in Physical Training (Men)

FRESHMEN take *Physical Training 1-2* (including *1a*) throughout the year. *Physical Training 1a* (six lectures on Personal Hygiene by the Dean of Men) extends through October, and *Physical Training 1-2* (Gymnasium Practise, two hours a week, begins November 1.

The Dean of Men may excuse from the required gymnasium practise such men students as are doing manual labor or present other legitimate reasons; he may also give permission to defer physical training for the current year.

(c) Registration in Military and Physical Training (Men)

FRESHMEN other than those excepted in paragraph 12a and SOPHOMORES except those excused for physical disability will find their registration in Military printed on their study-lists.

FRESHMEN should register for Physical Training 1 (first semester) and Physical Training 2 (second semester) as they would for any other sectional course.

JUNIOR AND SENIOR OFFICERS, in registering for *Military 2c-2d*, must reserve the four o'clock hour on Monday, Tuesday, Wednesday, and Thursday, and should put all four hours down on their study-lists.

SOPHOMORES WHO ARE SERGEANTS and JUNIORS AND SENIORS (COMMISSIONED OFFICERS) should register for *Military 3a-3b* as they would for any other sectional course.

(d) Assignment to Companies

Assignment to companies in the Regiment will be made by the Commandant.

The assignments in the Regiment will be posted on the Military Bulletin Board on the first floor of Engineering Hall, west end, on Saturday, September 26. Military drill will begin on Monday, September 28.

(e) Uniforms

All students registering in Military for the first time must report *on registration day* at Room 104, Engineering Hall to be measured for uniforms.

13. *Physical Training for Women*

FRESHMEN WOMEN have gymnasium practise three hours a week throughout the year, and lectures on Hygiene by the Dean of Women at 4 o'clock on Monday throughout the first semester.

They should register for *Physical Training 9* (Hygiene) at 4 o'clock on Monday; and should register for *Physical Training 7a-7b* (Gymnasium Practise) as they would for any other sectional course.

The Dean of Women may excuse from the required gymnasium practise such women students as are doing manual labor or present other legitimate reasons; she may also give permission to defer physical training for the current year.

14. *Students Earning Their Way*

Students who are making their own expenses, either in whole or in part, during the school year should state that fact to their advisers when making up their schedules. Experience has shown conclusively that such students should carry light work.

15. *Credit for Rhetoric 1 by Examination*

Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. An examination to test such proficiency will be given at 7:00 p. m., on the first day of registration (Monday, September 21). The results of this examination will be announced the following morning. Students who try this examination should defer their registration until they learn whether or not they have passed in the examination.

16. *Conditional Freshmen*

A student who lacks not more than two of the fifteen units required for matriculation may be entered as a conditioned freshman, provided—

(a) He is enrolled in at least nine hours of work for university credit;

(b) All his entrance conditions are such as can be made up during his first year.

No student having entrance conditions may continue a second year, except on the recommendation of the faculty of the college or school in which he is enrolled, approved by the Council of Administration. Petitions on the part of conditioned freshmen for permission to continue a second year are granted only in very exceptional cases.

Conditions may be made up by passing entrance examinations, which are held three times in each year—in January just before the beginning of the second semester, in July during the Summer Session, and in September during the week before the fall registration; or they may be made up, except in English, mathematics, and physics, by offering certain college courses for entrance credit, at the rate of one semester of college work for one unit of entrance credit.

In this way freshmen conditioned in *foreign languages* may offer German 1 or French 1a for 1 unit and German 1 and 3 or French 1a and 1b for 2 units.

Freshmen conditioned in *history* may offer History 1a for 1 unit; History 1a and 1b may be offered for 2 units.

Freshmen conditioned in *science* may offer Botany 1, Chemistry 1, or Zoology 1 for 1 unit each.

Students will not be admitted to English 10-11 or Rhetoric 1-2 who cannot meet the entrance requirements in English composition and literature. Students conditioned in *English* or in *mathematics* must arrange for making up their conditions in these subjects by tutoring. Lists of tutors in these subjects approved by the University may be obtained at the Registrar's Office or at the office of any one of the deans.

Students conditioned in *physics* in the College of Engineering must ordinarily arrange to take the subject in class in either the Champaign or the Urbana High School.

Students conditioned in *electives* may offer for entrance credit some one or two of the courses named above for which they have not had high-school equivalents.

17. *Listeners or Visitors*

Permission to attend classes as listeners or visitors is granted to registered students only with the consent of the instructor of the class and with the approval of the dean of the college or the director of the school in which the student is enrolled. *Students who visit a course as listeners are not allowed an examination for credit.*

Permission to attend classes regularly as listeners only may be given to persons who are not connected with the University, on the following conditions:

(a) They must first secure the consent of the instructor concerned and of the dean of the college in which the course is given.

(b) They must pay a fee of \$7.50 for each course attended.

No instructor is allowed to admit any such listeners to any of his classes except on presentation of a written certificate showing that he has complied with the foregoing conditions.

Visitors' permits should not be applied for on registration days.

18. *Late Registration*

A student registering late must first get a *permit*, if a man, of the Dean of Men, if a woman, of the Dean of Women; and, if a former student, must pay a fee of one dollar. Having secured the permit of the Dean of Men or of Women, a *new student* will apply to the Registrar for a study-list; a *former student not in attendance the previous semester* will also apply to the Registrar; a *former student who has been in attendance the previous semester* will find his study-list at the office of his dean or director. (The permits of the Deans of Men and of Women mentioned in this rule are not substitutes for the permits required in the case of *former students not in good standing*. See paragraph 5.)

19. *Week Old Study-Lists Invalid*

A study-list becomes invalid if not filed at the Business Office within one week after the date of its issue; in this case the student becomes subject to the provisions of paragraph 18.

20. *Changes in Study-Lists*

Permission to change study-lists after registration may be obtained only from the dean of the college or the director of the school in which the student is enrolled. No changes can be made on the registration days.

Changes in study-lists must be completed and filed at the Business office not later than 5:00 p. m. of the tenth day of classwork as scheduled, or a fee of \$1.00 will be charged for each change; provided that the total charge for the re-arrangement provided for on any one change slip shall not exceed \$2.00.

21. *Number of Hours Prescribed*

That the time of students may be fully occupied, each person is required to pursue studies aggregating *not less than fifteen nor more than eighteen hours*; except that students in courses requiring more than such number of hours in any semester are not limited as to such required hours by this rule; and, excepting further, that a student whose standing in each study of the preceding semester has been 90 may take for the semester studies aggregating

not more than twenty hours. A student may be permitted to take more or less than the amount of work prescribed above only on the permission of the dean of his college or the director of his school, or a three-fourths vote of his college faculty at a formal meeting.

22. *Required Subjects Take Precedence*

Any required subject in which there is a failure must upon the first recurrence of such subject take precedence over all other subjects.

23. *Credit Forfeited by Reregistering*

By registering in a subject for which he has a credit a student thereby forfeits his credit and must complete the work required of the class. If a course is repeated, the grade given at the close becomes the official grade.

24. *Candidacy for Graduation*

Candidates for graduation must have completed by the end of the first semester of the year of graduation all studies required therefor, except those to be taken in class in the second semester; provided, that a failure in the first semester's work must be made up not later than one month after the beginning of the second semester.

25. *Courses with Variable Credit*

In registering for a course with variable credit hours (e. g., Agronomy 13, 2-5 hours), a student must specify at the time of registration the number of hours for which he proposes to take the course.

26. *"Regulations"*

Every student should obtain, at the office of his dean, a copy of the "Regulations for the Guidance of Undergraduate Students," should read it through, and should keep it for reference.

THE COLLEGE OF LIBERAL ARTS AND SCIENCES

I. DIRECTIONS FOR FRESHMEN

- (1) Read paragraphs 1, 2, 12, 13, 14, 15, 16, 18, 19, 21, 25, and 26, pages 5-11.
- (2) Obtain your study-list, (1) *if you already have a permit to register*, at the desk on the first floor of University Hall, opposite the main entrance; (2) *if you have not yet secured a permit to register*, at the Registrar's office, 321 Natural History Building.
- (3) Follow, *point by point*, the directions on the first coupon of the study-list.
- (4) You will find your advisers in one of the following places:

FRESHMEN ADVISERS

Freshmen in Business Administration in Room 101, Commerce Building.

Freshmen whose major work is to be in language, economics (not business), education, English, history, philosophy, political science, psychology, or sociology, in Room 208, University Hall; in household science, in Room 307, University Hall.

Freshmen whose major work is to be in astronomy, botany, chemistry, entomology, geology, mathematics, physics, physiology (not medicine), or zoology, in Room 418, Natural History Building; those in the Course Preparatory to Medicine (see page 36), in Room 419, Natural History Building; those in ceramics or ceramic engineering (see page 39), in Room 422, Natural History Building; those in chemistry and chemical engineering (see pages 37, 38), in Room 420, Natural History Building.

STUDIES FOR FRESHMEN

The total number of hours for which any freshman registers must be not less than fifteen nor more than eighteen, including the required subjects, except by permission of the Assistant Dean, Room 304, University Hall. A student who cannot devote his entire time to his studies because of ill health, outside work necessary to meet expenses (see paragraph 14, page 9), or other good reason, should consult with the Assistant Dean before registering.

1. *Required.*—All men who enter as freshmen must register for *Rhetoric 1-2* (except those in the Course in Chemistry or Chemical Engineering), *Military 2a*, and *Physical Training 1-2 and 1a*. All women who enter as freshmen must register for *Rhetoric 1-2*, and *Physical Training 7a-7b and 9*. Excuse from Military or Physical Training may be secured for good reason *after registration* from the Dean of Men, Room 330, Natural History Building, in the case of men, and from the Dean of Women, Room 102, Woman's Building, in the case of women. (*For directions for registering in Military and Physical Training see paragraph 12, page 7.* In addition to the above all freshmen (except those in the Course Preparatory to Medicine, in the Two-Year Course in Accountancy, in Ceramics, and in Ceramic Engineering) must take *foreign language*. Freshmen whose major work is to be in one of the natural sciences and who

have not had at least a one-year course in chemistry or physics in an accredited high school, should register for one or both of these subjects during the year.

2. *Elective*.—The subjects listed below are open to freshmen. *Do not register for any others.* Courses should be selected from at least *three of the five groups*, not counting art and design, household science, or library science.

Freshmen are advised not to register for more than one *beginning* course in foreign languages at the same time, nor for more than two five-hour laboratory courses.

Students who wish to continue their study of Latin in the University are strongly urged to take Greek also. The Greek and Latin classics are important as a foundation for the serious study of modern literature, history, philosophy, and education. Students who wish to specialize later in history and politics are advised to take History 1a-1b in their freshman year.

Music.—For courses in music see page 257. The first five courses may be counted for credit in this College. Others may be taken without credit. Students wishing to enter courses in music must consult the Director of the School of Music, Room 202, University Hall, and secure from him a slip designating the course and the fee. This slip must be presented to the class adviser. The total number of hours including music must not exceed eighteen. Not more than sixteen hours of regular work should be entered upon the registration blank of freshmen who take music.

Law.—Students planning to enter the College of Law after two years of study in this College take the prescribed subjects: Rhetoric, Military, Physical Training, Foreign Language (preferably Latin, if three units have been offered for entrance, German with one or more units of entrance, or French with or without entrance credit). They are advised to make up the rest of the schedule from among the following subjects: Economics, History, Mathematics (see page 64 for a recommended program). *Courses in Law may not be taken by students enrolled in this College before the senior year. Consult advisers in Room 208, University Hall.*

For the description and time-table of each of the courses named below see the Description of Courses, beginning on page 79. The courses are arranged in alphabetical order by departments.

FIRST SEMESTER

- I. English 10¹ (3)²; Rhetoric 1 (3).
 - II. French 1a (4) or 2a (4); German 1 (4) or 3 (4) or 4 (4) or 5 (4);
Greek 1a (4) or 7 (3); Latin 1a (4) or 2a (4); Spanish 1a (4)
or 2a (3) or 3a (2).
 - III. Mathematics 2 (3) and 4 (2).
 - IV. Economics 7 (3) and 26 (3); History 1a (4) or 2a (3).
 - V. Astronomy 1 (3); Botany 1 (5), 2a³ (5); Chemistry 1⁴ (5) or 1a⁴ (4);
Entomology 1a (2); Geology 1 (5), 3⁴ (5), 14 (3), 23⁴ (5); Physics
7a⁵ and 8a⁵ (5); Physiology 4a (5); Zoology 1⁴ (5).
- Household Science 2 (2) or 7a (2).
Library Science 12 (2).
Art and Design 1 (3).

¹English 10-11 is open only to freshmen who have presented the minimum amount of English required for admission. See the description of this course, page 79.

²The figure immediately following the subject is the number of the course (see page 79); the figure in parenthesis indicates the number of credit hours to be secured in the course each semester.

³Either semester may be taken separately, or both together; entrance botany required.

⁴May be taken in either semester, but not in both.

⁵Prerequisite: Mathematics 4 (Trigonometry) which may be taken at the same time.

SECOND SEMESTER

- I. English 11¹ (3)²; Rhetoric 2 (3).
- II. French 1b (4) or 2b (4); German 3 (4) or 4 (4) or 5 (4) or 6 (4) or 7 (4); Greek 1b (4), 4 (4), or 6 (3); Latin 1b (4), or 2b (4); Spanish 1b (4) or 2b (3) or 3b (2).
- III. Mathematics 6 (5).
- IV. Economics 22 (3) and 27 (3); History 1b (4) or 2b (3).
- V. Astronomy 4 (5); Botany 1 (5), 2b³ (5); Chemistry 1⁴ (5) or 1a⁴ (4), or 2 and 3 (5); Entomology 1b (2); Geology 1a (5), 3⁵ (5), 8 (3), 10 (3), 12 (5); Physics 7b⁵ and 8b⁵ (5); Zoology 2 (5), 1⁴ (5), or 16 (2).
- Household Science 1 (3).
- Art and Design 1 (2).

CONDITIONED FRESHMEN

Conditioned freshmen should see paragraph 16, page 9.

II. DIRECTIONS FOR STUDENTS OTHER THAN FRESHMEN IN THE GENERAL COURSE IN LIBERAL ARTS AND SCIENCES

1. Read paragraphs 1-26, pages 5-11.
2. Students in attendance the second semester of 1913-14 and in good standing will obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Students not in college last semester or not in good standing see paragraphs 4 and 5, page 6.
3. Follow, *point by point*, the directions on the first coupon of the study-list.
4. Students who registered for the first time in September, 1913, or February, 1914, as *freshmen in general courses* (liberal arts or science), or in *household science*, and who are candidates for the A. B. degree, must comply with the *new requirements for graduation* as described on pages 20-22. (See also 10 below).
5. Students who have essentially *junior* or *senior standing in general courses* (liberal arts or science) or in *household science* and who are candidates for the A. B. degree may register in accordance with the old requirements for graduation in their particular course, as described on pages 17-20, or they may proceed under the new requirements stated on pages 20-22.
6. Students who have not completed their *military* and *physical training* requirements must register for these subjects. (See page 7.)
7. No student may take less than fifteen hours without special permission of the Assistant Dean, Room 304, University Hall, nor more than eighteen unless his standing in each of the studies of the previous semester was at least 90.

¹English 10-11 is open only to freshmen who have presented the minimum amount of English required for admission. See the description of this course, page 174.

²The figure immediately following the subject is the number of the course (see page 79); the figure in parenthesis indicates the number of credit hours to be secured in the course each semester.

³Either semester may be taken separately, or both together; entrance botany required.

⁴May be taken in either semester, but not in both.

⁵Prerequisite: Mathematics 4 (Trigonometry) which may be taken at the same time.

8. A student who cannot devote his entire time to his studies because of ill health, outside work necessary to meet expenses, or other good reason, should consult with the Assistant Dean before registering.

9. Students should choose their *major subject*, indicating it on the registration blank, not later than at the beginning of the *junior* year. The study-lists of all *juniors* and *seniors* should be made up after consultation with the departments in which the major subject is chosen.

10. The requirements in the various departments for *majors* and *minors* according to the *new requirements for the A. B. degree* in general courses will be determined during the coming year. Students who are to meet these requirements should consult with the departments in which the major subject is chosen.

11. Attention is called to the statement regarding the *Honor Degree* on page 76 of this circular, or on page 181 of the catalog (Annual Register) for the year 1913-14.

12. *Music*. For Courses in Music consult page 257. The first five courses may be counted for credit in this College. Others may be taken without credit.

Students wishing to enter courses in Music must consult the Director of the School of Music, Room 202, University Hall, and secure from him a slip designating the course and the fee. This slip must be presented to the class adviser who will then add the course to the student's study-list, provided the total number of hours including music does not exceed eighteen.

13. *Education*. Students who plan to teach should see the announcement of the School of Education, page 60.

14. *Library Science*. Students who plan to take a library course after graduation from his college should consult the Preliminary Course outlined by the Library School, page 66.

15. *Law*. Courses in Law may not be taken by students enrolled in this college before their senior year.

CLASS ADVISERS IN GENERAL COURSES

- (1) Students whose major work is to be in *language, economics* (not business), *education, English, history, philosophy, political science, psychology, or sociology*:
 - (a) Freshmen and sophomores.....Room 208, University Hall
 - (b) JuniorsRoom 302, University Hall
 - (c) Seniors (including all students who plan to graduate in June, 1915).....Room 308, University Hall
- (2) Students whose major work is to be in *astronomy, botany, chemistry* (general), *entomology, geology, mathematics, physics, physiology* (not medicine), or *zoology*:
 - All classes.....Room 418, Natural History Building
- (3) Specials.....Room 315, University Hall

REQUIREMENTS FOR GRADUATION IN GENERAL COURSES

Note

Students who have essentially junior or senior standing (that is, in general, 60 semester hours or more) and who are candidates for the A. B. degree may

register either in accordance with the requirements of the former Colleges of Literature and Arts and Science (now combined), or in accordance with the requirements of the new College of Liberal Arts and Sciences.

Students who registered for the first time in September, 1913, or in February, 1914, and who are candidates for the A. B. degree must comply with the new requirements.

For the new requirements see page 20.

The "old requirements" follow:

"The Old Requirements"

A. *University Requirements*.—Each candidate must meet the general University requirements as to residence and registration. He must also secure credit in approved courses amounting to 130 hours. An hour is one class period a week for one semester, each class period presupposing two hours' preparation by the student, or the equivalent in laboratory or drawing room.

B. *Prescribed Studies*.—Subjects specifically prescribed for all students: *Rhetoric 1-2** (6 hours); *Physical Training 1-2 and 1a for men, 7a-7b and 9 for women; Military Science 1 and 2 for men*. In addition, students who purpose to make a science their major subject, are required to have *Chemistry 1* and *Physics 7a-7b, 8a-8b (or 1a-1b, 3a-3b)* unless they have had one-year courses in these subjects in an accredited high school or acceptable equivalent courses elsewhere.

C. (1) *Group Requirements for the degree according to the schedule of the former College of Literature and Arts*.—Every candidate must offer a minimum of 8 hours in each of the following groups:

I. English, including literature and rhetoric.

II. Ancient and modern languages other than English, including Greek, Latin, the Germanic languages, and the Romance languages. Only courses which require the use of a foreign language may be counted in this group, and the 8 hours offered must all be in the same language.

III. The social sciences, including history, economics, political science, and sociology.

IV. Mathematics and philosophy, including mathematics, education, philosophy, and psychology. A candidate who elects mathematics must take at least five hours of it. If a student does not elect mathematics, his elections in this group must include work in at least two of the other departments of the group; that is, if he does not take mathematics, he must take either philosophy and psychology, or philosophy and education, or education and psychology. With the exception of mathematics, no subject of this group is open to freshmen.

V. The natural sciences, including astronomy, botany, chemistry, entomology, geology, physiology, physics, and zoology. Zoology 16 may not be counted toward this group requirement.

C. (2) *Group Requirements for the degree according to the schedule of the former College of Science*.—Each candidate must offer 8 hours in each of the following Groups: 1, 2, 3, and 5. In Group 4, 16 hours must be offered, provided that students who have had three years of work in foreign language in an accredited high school, or an equivalent course elsewhere, will be relieved

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2. may be excused from Rhetoric 1. See page 9.

from the requirement of Group 4, and similarly, those who have had one year or two years of foreign language may be relieved from 4 hours or 8 hours, respectively, of this requirement. The physics and chemistry of the prescribed list may be applied on the requirements of Groups 1 and 2.

Group 1.—Mathematics, physics, astronomy, logic (Philosophy 1), mineralogy (Geology 5).

Group 2.—Chemistry, geology, household science, bacteriology (Bacteriology 5).

Group 3.—Botany, zoology, physiology, psychology, entomology.

Group 4.—Foreign language.

Group 5.—English literature, history, political science, economics, philosophy, education.

D. (1) *Major Subjects according to the former College of Literature and Arts.*—Each candidate must select some one subject to be designated as his major, and secure credit in that subject to the amount of 24 hours. The courses selected for the last two years should include some distinctly advanced work. The subjects which may be recognized as majors in this college are subject to additions from time to time; at present they are as follows: Classics¹; economics; education; English² (including English literature and rhetoric); French³; German⁴; Greek¹; history; household science; Latin¹; mathematics; philosophy; political science; psychology; sociology.

D. (2) *Major Subjects according to the former College of Science.*—A total credit of at least 20 hours must be secured in some one of the divisions of the following major elective list. Not more than 40 hours' work (exclusive of thesis) in any one of these divisions may be applied toward graduation. In arranging the subjects to be counted toward the major requirement the student is advised to consult with the head of the department in which the major is taken.

Major electives are: Astronomy, botany, chemistry, education, entomology, geology (including mineralogy and physical geography), household science, library science, mathematics, physics, physiology, psychology, and zoology.

E. *Elective Subjects.*—The remainder of the course is made up of electives chosen under defined conditions.

1. Credit is regularly given for courses properly announced in the following subjects: Art and design (the total credit in this department is limited to 20 hours); astronomy, botany, chemistry, the classics, economics (including accountancy and commercial law), education, English, entomology, geology, Germanic languages, history, household science, library science, mathematics, philosophy, physics, physiology, political science, psychology, Romance languages, sociology, zoology.

2. Not more than 40 hours in any one subject may be counted for graduation, except when the student is writing a thesis. In this case he may count, in addition to the 40 hours, the hours of the seminar course in which he does his thesis work. In the department of English a student may take 40 hours in addition to Rhetoric 1-2.

3. No credit is granted in any subject unless the student pursues it for the full time required in the shortest course offered in that subject. For example,

¹For the definition of the major in this subject, see below, page 142.

²For the definition of the major in English, see below, page 142.

³A major in French must include 24 hours in addition to French 1a-1b.

⁴A major in German must include 24 hours in addition to German 1 and 3.

if the student elects a course which yields two hours of credit for one semester, he must stay in the class during the semester in order to get any credit at all. In order to secure any credit in a beginning course in a foreign language, a full year's work must be completed.

4. Seniors graduating under the schedule of the former College of Literature and Arts who register in courses open to freshmen may receive only one-half of the credit regularly assigned to such courses. The following courses are included in this list: Art and Design 1 and 2; Astronomy 1; Botany 1; Chemistry 1; English 1-2, 10-11, 20; Entomology 1a-1b; French 1a-1b; Geology 3, 10, 14, 23; German 1, 3; Greek 1a-1b; History 1a-1b, 2a; Household Science 2, 7a-7b; Latin 1a-1b; Library Science 12; Mathematics 2, 4; Rhetoric 1-2; Spanish 1a-1b; Zoology 1, 16.

5. A limited amount of credit toward the A.B. degree is ordinarily given for courses offered in other colleges and schools of this University. Students who continue under the schedule of the former College of Science may select, with the approval of the Dean, approximately one-third of the work to be counted toward a degree, from subjects given in other colleges of the University. Students who continue under the schedule of the former College of Literature and Arts will ordinarily confine their elections of work in other colleges and schools to the following courses:

Physical Training.—Not to exceed 5 semester hours.

Military Science and Tactics.—Military Science 1 and 2.

Law.—Law 1a-1b (Contracts); Law 2a-2b (Torts); Law 3 (Real Property); Law 4 (Pleading); Law 5 (Criminal Law); Law 6 (Personal Property). The total credit is limited to 24 hours. None of these courses may be taken before the senior year. Law 1a-1b may count for six hours only.

Engineering.—General Engineering Drawing 1 and 2 (Mechanical Drawing and Descriptive Geometry); Theoretical and Applied Mechanics 20 and 21 (Analytical Mechanics); Mechanical Engineering 12 or 11 (Thermodynamics); Civil Engineering 96 or 27 (Surveying); Architecture 31, 32 (Architectural Drawing); Architecture 13, 14, 15, 16 (History of Architecture); Electrical Engineering 4 and 21.

Agriculture.—Agricultural Extension 1 (Elementary Agriculture for teachers); Agronomy 25 (Seeds), for business students only; Agronomy 9 (Soil Physics); Farm Management 1; Agronomy 22 (Plant Breeding); Animal Husbandry 7 (Principles of Animal Nutrition); Animal Husbandry 30 (Principles of Evolution as Applied to the Improvement of Domesticated Animals and Plants); Horticulture 9 (Forestry); Horticulture 10a (Landscape Gardening); Horticulture 12 (Evolution of Horticultural Plants); Horticulture 19 (General Floriculture), for household science students only. The total credit allowed in these agricultural courses will not ordinarily exceed 14 hours.

Library Science.—Library 3a-3b (Selection of Books); 7 (History of Libraries); 9 (Book Making); 12 (General Reference); 13a-13b (Public Documents). The total credit allowed in Library Science will not ordinarily exceed 14 hours. The course in General Reference (Lib. 12) is of special value to students in the courses in Literature and Arts.

Music.—Music 1-2, 3-4, 5-6, 7-8, 9-10 and 12-13 (courses in the history and theory of music).

Courses not listed under paragraphs 1 to 5 above may not be counted for the degree of A.B., except by special permission of the Dean of the College.

F. *Bachelors' Theses*.—A bachelor's thesis is not generally required in this College. Students of high standing are, however, encouraged to write theses

in connection with their major studies. Credit toward the degree is given for thesis work only as a part of the work in some course for which the student is registered. Students desiring to take a thesis course in geology or mineralogy may add to their credits in those subjects the credits received for chemistry; and students in physiology may add to their credits in that subject those in zoology and bacteriology. Only students graduating with a thesis will, as a rule, be selected for fellowships, scholarships, and other similar university honors. Candidates for honors or the honor degree, are required by the general regulations of the University to write a thesis. See below, page 76.

"The New Requirements"

(See note, page 15.)

Requirements for the A.B. Degree

- A. *Prescribed Subjects*.—Rhetoric 1-2; Physical Training 1-2 and 1a for men; Physical Training 7a-7b and 9 for women; Military Science 1 and 2 for men.
- B. *Group Requirements*.—Every candidate must offer the minimum of work specified in each of the following groups:
 - I. *English*.—The offering in this group must include at least a one-semester course in literature.
 - II. *Foreign Languages and Literatures* (exclusive of courses in translation).
If a student has offered but two units of a foreign language for entrance to the University, he must pursue the study of foreign language through two-year courses or the equivalent. If he has offered for entrance three or more units of foreign language, he must continue the study of foreign language through one year of his college course.
Note: Candidates for the degree who have not offered Greek or Latin or French or German for entrance must offer one of these languages for graduation.
 - III. *History, Political and Social Science*.—History, economics, political science, sociology: 8 hours.
 - IV. *Mathematics and Physical Science*.—Mathematics, astronomy (courses with college mathematics as prerequisites), physics, chemistry: 8 hours.
 - V. Botany, entomology, geology, physiology, zoology: 8 hours.
 - VI. Education, philosophy, psychology: 6 hours, of which 3 shall be in philosophy or psychology.
- C. *Major Subjects*.—Each candidate must select some one subject as his major. A major consists of courses amounting to 20 hours chosen from among those designated by a department and approved by the faculty of the college. Such courses are to be exclusive of those elementary or beginning courses which are open to freshmen, and inclusive of some distinctly advanced work.

The subjects at present recognized as majors in this college are: Astronomy, bacteriology, botany, chemistry, classics, education, economics, English, entomology, French, geology, German, Germanic languages, Greek, history, household science, Latin, mathematics, philosophy,

physiology, physics, political science, psychology, Romance languages, sociology, zoology.

- D. *Minor Subjects*.—Each candidate must offer, in addition to his major, a minor of 20 hours in one or more allied subjects designated by the major department and approved by the faculty of the college. At least 8 hours must be offered in one subject.

E. *Elective Subjects*.—

1. Not more than 40 hours in any one subject may be counted for graduation, except: (a) in special courses approved by the faculty of the college; (b) when a student is writing a thesis, he may count, in addition to the 40 hours, the hours of the course in which he does his thesis work; (c) in the department of English a student may take 40 hours in addition to Rhetoric 1-2.

Note: The total credit in Art and Design is limited to 20 hours.

2. No credit is granted in any subject unless the student pursues it for the full time required in the shortest course offered in that subject. For example, if the student elects a course which yields two hours for one semester, he must stay in the class during one semester in order to get any credit at all. In order to secure any credit in a beginning course in a foreign language, a full year's work must be completed.

3. A limited amount of credit towards the A.B. degree is ordinarily given for courses offered in other colleges and schools of this University, as follows:

Physical Training: Not to exceed 5 semester hours.

Military Science and Tactics: Military Science 1 and 2.

Law: The amount of work to be credited from this college will be announced during the year.

Engineering: General Engineering Drawing 1 and 2 (Mechanical Drawing and Descriptive Geometry; Theoretical and Applied Mechanics 20 and 21 (Analytical Mechanics); Mechanical Engineering 12 and 11. (Thermodynamics); Civil Engineering 96 or 27 (Surveying); Architecture 31, 32 (Architectural Drawing); Architecture 13, 14, 15, 16 (History of Architecture); Electrical Engineering 4 and 64, or 61, 12, 62. The total credit allowed in these engineering courses will not ordinarily exceed 24 hours.

Agriculture: Agricultural Extension 1 (Elementary Agriculture for Teachers); Agronomy 12, Agronomy 25 (Seeds), for business students only; Agronomy 9 (Soil Physics); Farm Management 1; Agronomy 22 (Plant Breeding); Animal Husbandry 7 (Principles of Animal Nutrition); Animal Husbandry 30 (Principles of Evolution as Applied to the Improvement of Domesticated Animals and Plants); Horticulture 9 (Forestry); Horticulture 10a (Landscape Gardening); Horticulture 12 (Evolution of Horticultural Plants); Horticulture 19 (General Floriculture), for household science students only. The total credit allowed in these agricultural courses will not ordinarily exceed 14 hours.

Library Science: Library 7 (History of Libraries); 9 (Bookmaking); 2a-2b or 12 (General Reference); 13a-13b (Public Documents). The course in General Reference (Lib. 12) is of special value to students in the College of Liberal Arts and Sciences.

Music: Music 1-2, 3-4, 5-6, 7-8, 9-10, and 12-13 (courses in the history and theory of music).

Courses not listed under paragraphs 1 to 5 above may not be counted for the degree of A.B., except by special permission of the Dean of the College.

- F. *Bachelor's Theses:* A bachelor's thesis is not generally required in this College. Students of high standing are, however, encouraged to write theses in connection with their major studies. Credit toward the degree is given for thesis work only as a part of the work in some course for which the student is registered. The presentation of a thesis is specifically required of all candidates for the honor degree.

Requirements for the B.S. Degree

Pending further action by the College of Liberal Arts and Sciences and by the Senate, students admitted to work leading to the degree of Bachelor of Science in the General Science Course, [see under "The Old Requirements," pages 17-20, especially paragraphs C(2) and D(2)], who have completed that course including a major in Groups 4 or 5, together with two year courses or their equivalent in foreign language, will be graduated with the degree of Bachelor of Science.

III. DIRECTIONS FOR STUDENTS IN BUSINESS COURSES

1. Look over the General Directions contained in paragraphs 1-26, pages 5-11.
2. Freshmen who have already secured permits to register and all other students who were in attendance the second semester of 1913-14 and are in good standing will obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Freshmen without permits, see paragraph 1, page 5. Other students not in attendance last semester or not in good standing, see paragraphs 4 and 5, page 6.
3. Report to the Commerce Building for registration.
4. Follow, *point by point*, the directions on the first coupon of your study-list.
5. Secure the approval of the Assistant Director, in Room 103, Commerce Building, who is your adviser.

REQUIREMENTS FOR GRADUATION IN BUSINESS COURSES

For the present the requirements for graduation for students in the Courses in Business Administration will remain as they have been in the past. In order to graduate from the University in these Courses, the student must secure credit for 130 hours of study, including prescribed military and physical training. Every student must take work aggregating at least eight hours of credit in each of the following *groups* of subjects:

- I. English language and literature, including rhetoric.
- II. Latin, Greek, French, German, Italian, Spanish.

III. History, economics, sociology, and political science.

IV. Mathematics, education, philosophy, and psychology.

V. Astronomy, botany, chemistry, entomology, geology, physiology, physics, and zoology.

Students in Business Administration must also take :

(1) Six hours from the following subjects in the freshman year: Economic Resources (Econ. 26), Modern Industries (Econ. 27), Economic History of England (Econ. 7), Economic History of the United States (Econ. 22).

In the case of students transferring from other colleges or institutions with advanced standing in the Business Courses this requirement may be modified to suit individual needs.

(2) Principles of Economics (Econ. 1).

(3) Business Writing (Rhet. 10). Senior Conference on Written Work (Rhet. 25-26).

(4) Principles of Accounting (Acc'y. 1a-1b).

(5) Commercial Law (Econ. 25a-25b).

Business students are required to make economics their major. For the present 24 hours will be required as in the past, but not more than 6 hours of freshman economics (Economics 7, 22, 26, and 27) may be counted towards the major.

Suggested outlines follow. These should be used in connection with the foregoing statement of requirements.

General Business Course

Every student must take 15 to 18 hours of work each semester. Students desiring mathematics, or taking courses requiring it, should elect it the first year, omitting Economic Resources (Economics 26), or Economic History of the United States (Economics 22), and science, which may then be elected the second year.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 1)
Military
Physical Training
Economic Resources (Econ. 26) or
English Econ. Hist. (Econ. 7)
Mathematics (Math. 2, 4) or
Science

Prescribed Subjects

Principles of Econ. (Econ. 1)
Amer. Gov't (Pol. Sci. 1)
Military
History of U. S. (Hist. 3a) or
English History (Hist. 2a) or
European History (Hist. 1a)

Suggested Electives

Foreign language continued
Mathematics
Science

SECOND SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 2)
Military
Physical Training
Modern Industries (Econ. 27) or
Econ. Hist. of U. S. (Econ. 22)
Mathematics (Math. 6) or
Science

SECOND YEAR

Prescribed Subjects

Money and Banking (Econ. 3)
Business Organization (Econ. 6)
Business Writing (Rhet. 10)
Military
State and Local Gov't (Pol. Sci. 3)
History of U. S. (Hist. 3b) or
English History (Hist. 2b) or
European History (Hist. 1b)

Suggested Electives

Foreign language continued
Mathematics
Science

THIRD YEAR

Prescribed Subjects

Elementary and Intermediate Accounting
(Acc'y 1b)
Domestic Com. (Econ. 28) or
Foreign Com. (Econ. 29)

Suggested Electives

History
Public Finance (Econ. 5)
Foreign language continued
Advanced Accounting and Auditing (Acc'y
2a)
Railway Transportation (Econ. 41)
State Administration (Pol. Sci. 13)
Psychology (Psych. 1)
Municipal Gov't (Pol. Sci. 4)
Sales Correspondence (Rhet. 21)

Prescribed Subjects

Elementary and Intermediate Accounting
(Acc'y 1b)
Corporation Management (Econ. 10)
Organization of Foreign Com. (Econ. 31)
or
Tariff and Customs Regulations (Econ. 30)

Suggested Electives

History
Indust. Consolid. (Econ. 11)
Foreign language continued
Advanced Accounting and Auditing (Acc'y
2b)
Railway Rates (Econ. 42)
Psychology (Psych. 2)
Logic (Phil. 1)
Summarizing and Abstracting (Rhet. 22)

FOURTH YEAR

Prescribed Subjects

Seminar (Econ. 18a)
Conference on Written Work (Rhet. 25)
Labor Problems (Econ. 12)
Commercial Law (Econ. 25a)
Salesmanship (Econ. 37)

Suggested Electives

Political Ethics (Phil. 9)
Constitutional Law (Pol. Sci. 5)
Finan. Hist. of U. S. (Econ. 4a)
(See also third year electives)

Prescribed Subjects

Seminar (Econ. 18b)
Conference on Written Work (Rhet. 26)
Commercial Law (Econ. 25b)
Economic Development of Europe (Econ. 13)
Advertising (Econ. 38)

Suggested Electives

Economic Reform (Econ. 21)
Finan. Hist. of U. S. (Econ. 4b)
(See also third year electives)

Course for Commercial and Civic Secretaries

This course is intended for students who expect to take service with chambers of commerce, commercial clubs, and civic organizations. The work of the first and second years is the same as in the general business course.

THIRD YEAR

■ FIRST SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
(Acc'y 1a)
Domestic Commerce (Econ. 28) or
Foreign Commerce (Econ. 29)
Municipal Gov't (Pol. Sci. 4)

Suggested Electives

Sales Correspondence (Rhet. 21)
Public Finance (Econ. 5)
Prin. of Sociol. (Sociol. 1)
State Administration (Pol. Sci. 13)
Political Ethics (Phil. 9)
Property Insurance (Econ. 34)

SECOND SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
(Acc'y 1b)
Organization of Foreign Commerce (Econ.
31) or
Tariff and Customs Regulations (Econ. 30)
Corporation Management (Econ. 10)
Charities (Sociol. 8)

Suggested Electives

Summarizing and Abstracting (Rhet. 22)
Industr. Consolidations (Econ. 11)
Nat. Administration (Pol. Sci. 12)
Logic (Phil. 1)
Gov't of Illinois (Pol. Sci. 16)

FOURTH YEAR

Prescribed Subjects

Commercial Law (Econ. 25a)
 Railway Transportation (Econ. 41)
 Foreign Commerce (Econ. 29) or
 Domestic Commerce (Econ. 28)
 Conference on Written Work (Rhet. 25)
 Salesmanship (Econ. 37)

Suggested Electives

Seminar (Econ. 18a)
 Constitutional Law of U. S. (Pol. Sci. 5)
 Labor Problems (Econ. 12)
 Population (Sociol. 10)

Prescribed Subjects

Commercial Law (Econ. 25b)
 Railway Rates (Econ. 42)
 Tariff and Customs Regulations (Econ. 30)
 or
 Organization of Foreign Commerce (Econ. 31)
 Conference on Written Work (Rhet. 26)
 Advertising (Econ. 38)

Suggested Electives

Seminar (Econ. 18b)
 Social and Industrial Problems (Pol. Sci. 11)
 Economic Reform (Econ. 21)
 Criminology (Sociol. 9)

Course in Banking

The work of the first and second years in banking is the same as in the course in general business, but students must take advanced algebra (Math. 2), which is a prerequisite for the mathematics of investment (Math. 23).

THIRD YEAR

FIRST SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
 (Acc'y 1a)
 Public Finance (Econ. 5)

Suggested Electives

Domestic Com. (Econ. 28)
 Logic (Phil. 1)
 History

SECOND SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
 (Acc'y 1b)
 Math. of Investment (Math. 23)
 Corporation Management (Econ. 10)
 Economic Development of Europe (Econ. 13)

Suggested Electives

Tariff and Customs Regulations (Econ. 30)
 Indust. Consolid. (Econ. 11)
 History

FOURTH YEAR

Prescribed Subjects

Practical Banking (Econ. 9)
 Finan. Hist. of U. S. (Econ. 4a)
 Foreign Com. (Econ. 29)
 Commercial Law (Econ. 25a)
 Seminar (Econ. 18a)
 Conference on Written Work (Rhet. 25)

Suggested Electives

Labor Problems (Econ. 12)
 Political Ethics (Phil. 9)
 Advanced Accounting and Auditing (Acc'y 2a)

Prescribed Subjects

The Money Market (Econ. 8)
 Finan. Hist. of U. S. (Econ. 4b)
 Commercial Law (Econ. 25b)
 Seminar (Econ. 18b)
 Conference on Written Work (Rhet. 26)

Suggested Electives

Organization of Foreign Commerce (Econ. 31)
 Advanced Accounting and Auditing (Acc'y 2b)

Course in Insurance

The work of the first and second years in insurance is the same as in the course in railway traffic and accounting, except that Economics 7 (Econ. Hist. of England) may take the place of Economic Resources (Econ. 26), and that any other science may be taken instead of physics. (See page 28.)

THIRD YEAR

FIRST SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
(Acc'y 1a)
Amer. Gov't (Pol. Sci. 1)

Suggested Electives

Foreign language continued
History of U. S. (Hist. 3a)
European History (Hist. 1a)
Public Finance (Econ. 5)
Sales Correspondence (Rhet. 21)

SECOND SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
(Acc'y 1b)
Corporation Managem't (Econ. 10)
Mathematics of Investment (Math. 23)
State and Local Gov't (Pol. Sci. 3)

Suggested Electives

Foreign language continued
History of U. S. (Hist. 3b)
European History (Hist. 1b)
Summarizing and Abstracting (Rhet. 22)

FOURTH YEAR

Prescribed Subjects

Property Insurance (Econ. 34)
Commercial Law (Econ. 25a)
Sem. in Insur. (Econ. 18a)
Conference on Written Work (Rhet. 25)
Actuarial Theory (Math. 31)
State Administration (Pol. Sci. 13)

Suggested Electives

Finan. Hist. of U. S. (Econ. 4a)
Political Ethics (Phil. 9)
Labor Problems (Econ. 12)
Practical Banking (Econ. 9)
Salesmanship (Econ. 37)

Prescribed Subjects

Econ. of Insurance (Econ. 33)
Commercial Law (Econ. 25b)
Sem. in Insur. (Econ. 18b)
Conference on Written Work (Rhet. 26)

Suggested Electives

Finan. Hist. of U. S. (Econ. 4b)
Econ. Development of Europe (Econ. 13)
Indus. Consolid. (Econ. 11)
Money Market (Econ. 8)
Advertising (Econ. 38)

Courses in Accountancy

The development of the commercial, industrial, and financial interests of the country has given rise to a demand for three classes of workers in accountancy, (1) the teacher, (2) the business executive, (3) the public accountant.

In order to give students adequate preparation for these three fields, the University offers several courses of study:

1. A four years' course in business administration with a maximum of work in accountancy, economics, history, political science, statistics, language, and other subjects.

2. Work in accountancy open to election by students in business administration as part of the general training necessary to a successful business executive.

3. A two years' special course in preparation for the examinations required by law for securing a certificate as a Certified Public Accountant.

According to this law, passed in 1903, establishing accountancy upon a professional basis, candidates are required to pass examinations in commercial law as affecting accountancy, the theory of accounts, practical accounting, and auditing.

Four-Year Course in Accountancy

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 1)
Military
Physical Training
Algebra and Trig. (Math. 2, 4)
English Econ. Hist. (Econ. 7) or
Economic Resources (Econ. 26)

SECOND SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 2)
Military
Physical Training
Analytical Geom. (Math. 6)
Modern Industries (Econ. 27) or
Econ. Hist. of U. S. (Econ. 22)

SECOND YEAR

Prescribed Subjects

Principles of Econ. (Econ. 1)
 Elementary and Intermediate Accounting
 (Acc'y 1a)
 Military
 Science

Suggested Electives

Foreign language continued
 Calculus (Math. 7-9)
 European History (Hist. 1a)
 Hist. of U. S. (Hist. 3a)
 Amer. Gov't (Pol. Sci. 1)

Prescribed Subjects

Money and Banking (Econ. 3)
 Business Organization (Econ. 6)
 Business Writing (Rhet. 10)
 Elementary and Intermediate Accounting
 (Acc'y 1b)
 Military
 Science

Suggested Electives

Foreign language continued
 European History (Hist. 1b)
 Hist. of U. S. (Hist. 3b)
 State and Local Gov't (Pol. Sci. 3)

THIRD YEAR

Prescribed Subjects

Advanced Accounting and Auditing (Acc'y
 2a)
 Public Finance (Econ. 5)
 Municipal Gov't (Pol. Sci. 4)

Suggested Electives

Sales Correspondence (Rhet. 21)
 Foreign language
 Domestic Commerce (Econ. 28)
 Logic (Phil. 1)
 Railway Transportation (Econ. 41)

Prescribed Subjects

Advanced Accounting and Auditing (Acc'y
 2b)
 Corporation Managem't (Econ. 10)
 Mathematics of Investment (Math. 23)

Suggested Electives

Summarizing and Abstracting (Rhet. 22)
 Foreign language
 Tariff and Customs Regulations (Econ. 30)
 Railway Rates (Econ. 42)

FOURTH YEAR

Prescribed Subjects

Accounting Problems and Auditing (Acc'y
 3a)
 Commercial Law (Econ. 25a)
 Seminar (Econ. 18a)
 Conference on Written Work (Rhet. 25)
 Political Ethics (Phil. 9)

Suggested Electives

Practical Banking (Econ. 9)
 Finan. Hist. of U. S. (Econ. 4a)
 Labor Problems (Econ. 12)

Prescribed Subjects

Accounting Problems and Auditing (Acc'y
 3a)
 Commercial Law (Econ. 25b)
 Seminar (Econ. 18b)
 Conference on Written Work (Rhet. 26)

Suggested Electives

Money Market (Econ. 8)
 Finan. Hist. of U. S. (Econ. 4b)

Two-Year Course in Accountancy

This course is open only to students in accountancy who are preparing for the C. P. A. examinations, who are at least 20 years of age and able to matriculate in the University, and who can furnish satisfactory evidence of at least one year's experience in the office of a practising public accountant. The course must be taken as outlined. No variation from it is allowed.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
 (Acc'y 1a)
 Rhetoric (Rhet. 1)
 Finan. Hist. of U. S. (Econ. 4a)
 Algebra (Math. 2)
 Military
 Physical Training

SECOND SEMESTER

Prescribed Subjects

Elementary and Intermediate Accounting
 (Acc'y 1b)
 Business Organization (Econ. 6)
 Rhetoric (Rhet. 2)
 Money and Banking (Econ. 3)
 Mathematics of Investment (Math. 23)
 Military
 Physical Training

SECOND YEAR

Prescribed Subjects

Advanced Accounting and Auditing (Acc'y 2a)
 Accounting Problems and Auditing (Acc'y 3a)
 Commercial Law (Econ. 25a)
 Practical Banking (Econ. 9)
 Property Insurance (Econ. 34)
 Military

Prescribed Subjects

Advanced Accounting and Auditing (Acc'y 2b)
 Accounting Problems and Auditing (Acc'y 3b)
 Business Writing (Rhet. 10)
 Corporation Management (Econ. 10)
 Commercial Law (Econ. 25b)
 Economics of Insurance (Econ. 33)
 State and Local Gov't. (Pol. Sci. 3)
 Military

Courses in Railway Administration

There are two courses offered under the head of railway administration, one emphasizing those subjects which are of most value to the student interested in the accounting and traffic aspects of railway work, the other laying stress upon the transportation service, properly so called, and intended to prepare men directly for the transportation departments of railways.

Course in Railway Traffic and Accounting

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Foreign language
 Rhetoric (Rhet. 1)
 Military
 Physical Training
 Algebra and Trig. (Math. 2, 4)
 Economic Resources (Econ. 26) or
 Eng. Econ. Hist. (Econ. 7)

SECOND SEMESTER

Prescribed Subjects

Foreign language
 Rhetoric (Rhet. 2)
 Military
 Physical Training
 Analytical Geometry (Math. 6)
 Econ. Hist. of U. S. (Econ. 22) or
 Modern Industries (Econ. 27)

SECOND YEAR

Prescribed Subjects

Principles of Econ. (Econ. 1)
 Elementary and Intermediate Accounting (Acc'y 1a)
 Amer. Gov't (Pol. Sci. 1)
 Physics (Phys. 1a and 3a)
 Military

Prescribed Subjects

Money and Banking (Econ. 3)
 Business Organization (Econ. 6)
 Elementary and Intermediate Accounting (Acc'y 1b)
 Business Writing (Rhet. 10)
 Physics (Phys. 1b and 3b)
 Military

THIRD YEAR

Prescribed Subjects

Adv. Accounting and Audit. (Acc'y 2a)
 Railway Transportation (Econ. 41)
 Railway Operation (Econ. 45a) or
 Traffic Administration (Econ. 43a)

Prescribed Subjects

Adv. Accounting and Audit. (Acc'y 2b)
 Corporation Management (Econ. 10)
 Railway Rates (Econ. 42)
 Mathematics of Investment (Math. 23)
 Railway Operation (Econ. 45b) or
 Traffic Administration (Econ. 43b)

FOURTH YEAR

Prescribed Subjects

Accounting Problems and Auditing (Acc'y 3a)
 Traffic Admin. (Econ. 43a) or
 Railway Operation (Econ. 45a)
 Sem. in R'y Admin. (Econ. 18a)
 Conference on Written Work (Rhet. 25)
 Commercial Law (Econ. 25a)

Prescribed Subjects

Accounting Problems and Auditing (Acc'y 3b)
 Traffic Admin. (Econ. 43b) or
 Railway Operation (Econ. 45b)
 Sem. in R'y Admin. (Econ. 18b)
 Conference on Written Work (Rhet. 26)
 Commercial Law (Econ. 25b)

Course in Railway Transportation

In choosing additional courses to make up the required 130 hours of credit, six hours of such electives must be taken in history, political science, more advanced language, or philosophy.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 1)
Military
Physical Training
Gen. Engin. Drawing (G. E. D. 1)
Algebra and Trig. (Math. 2, 4)

SECOND SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 2)
Military
Physical Training
*Descriptive Geom. (G. E. D. 12)
Anal. Geom. (Math 6)

SECOND YEAR

Prescribed Subjects

Principles of Econ. (Econ. 1)
Calculus (Math. 2)
Physics (Phys. 1a, 3a)
Military

Prescribed Subjects

Money and Banking (Econ. 3)
Business Organization (Econ. 6)
Physics (Phys. 1b, 3b)
Military
Anal. Mech. (T. and A. M. 20)

THIRD YEAR

Prescribed Subjects

Railway Transportation (Econ. 41)
Traffic Admin. (Econ. 43a) or
Railway Operation (Econ. 45a)
Anal. Mech. and Resist. of Materials (T. and A. M. 21, 29)

Prescribed Subjects

Business Writing (Rhet. 10)
Railway Rates (Econ. 42)
Traffic Administration (Econ. 43b) or
Railway Operation (Econ. 45b)
Engines and Boilers (M. E. 1)
Electrical Engin. (E. E. 11)
Surveying (C. E. 96)

FOURTH YEAR

Prescribed Subjects

Railway Operation (Econ. 45a) or
Traffic Admin. (Econ. 43a)
Sem. in R'y Admin. (Econ. 18a)
Conference on Written Work (Rhet. 25)
Elementary and Intermediate Accounting (Acc'y 1a)
Labor Problems (Econ. 12)
Locomotives (R'y M. E. 1)
Engin. Materials (T. and A. M. 29)

Prescribed Subjects

Railway Operation (Econ. 45b) or
Traffic Admin. (Econ. 43b)
Mech. Engin. Lab. (M. E. 61)
Sem. in R'y Admin. (Econ. 18b)
Conference on Written Work (Rhet. 26)
Elementary and Intermediate Accounting (Acc'y 1b)
R'y Tests (R'y M. E. 11)
Mech. Engin. Lab. (M. E. 61)

Course for Commercial Teachers

This course is intended for students who are planning to teach commercial subjects in secondary schools.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 1)
Military
Physical Training
English Economic History (Econ. 7) or
Economic Resources (Econ. 26)
Mathematics (Math. 2, 4) or
Science

SECOND SEMESTER

Prescribed Subjects

Foreign language
Rhetoric (Rhet. 2)
Military
Physical Training
Econ. Hist. of U. S. (Econ 22) or
Modern Industries (Econ. 27)
Mathematics (Math. 6) or
Science

*This subject is to be taken for three hours' credit only.

SECOND YEAR

Prescribed Subjects

Principles of Econ. (Econ. 1)
 Amer. Gov't (Pol. Sci. 1)
 Psychology (Psychol. 1)
 Military
 History of U. S. (Hist. 3a) or
 European History (Hist. 1a)

Suggested Electives

Foreign language continued
 Mathematics
 Science
 English literature

Prescribed Subjects

Money and Banking (Econ. 3)
 Business Organization (Econ. 6)
 Business Writing (Rhet. 10)
 Psychology (Psychol. 2)
 Military
 History of U. S. (Hist. 3b) or
 European History (Hist. 1b)

Suggested Electives

Foreign language continued
 Mathematics
 Science
 English literature

THIRD YEAR

Prescribed Subjects

Elementary and Intermediate Accounting
 (Acc'y 1a)
 Prin. of Education (Educ. 1)
 Domestic Commerce (Econ. 28) or
 Foreign Commerce (Econ. 29)

Suggested Electives

History
 Foreign language continued
 Logic (Phil. 1)
 Public Finance (Econ. 5)
 Municipal Gov't (Pol. Sci. 4)
 Railway Transportation (Econ. 41)
 Sales Correspondence (Rhet. 21)

Prescribed Subjects

Elementary and Intermediate Accounting
 (Acc'y 1b)
 Corporation Managem't (Econ. 10)
 Hist. of Education (Educ. 2)
 Organization of Foreign Commerce (Econ.
 31) or
 Tariff and Customs Regulations (Econ. 30)

Suggested Electives

History
 Foreign language continued
 Intro. to Philosophy (Phil. 2)
 Prin. of Second. Educ. (Educ. 6)
 Railway Rates (Econ. 42)
 Summarizing and Abstracting (Rhet. 22)

FOURTH YEAR

Prescribed Subjects

Seminar (Econ. 18a)
 Conference on Written Work (Rhet. 25)
 Labor Problems (Econ. 12)
 Commercial Law (Econ. 25a)
 Observation and Technique of Teaching
 (Educ. 10)

Suggested Electives

Advanced Accounting and Auditing (Acc'y
 2a)
 Political Ethics (Phil. 9)
 Finan. Hist. of U. S. (Econ. 4a)
 Constitutional Law of U. S. (Pol Sci. 5)
 Practical Banking (Econ. 9)
 (See also third year electives)

Prescribed Subjects

Seminar (Econ. 18b)
 Conference on Written Work (Rhet. 26)
 Econ. Devel. of Europe (Econ. 13)
 Commercial Law (Econ. 25b)
 Social Education (Educ. 16) or
 School Hygiene (Educ. 15)

Suggested Electives

Advanced Accounting and Auditing (Acc'y
 2b)
 Social Reform (Econ. 21)
 Financial Hist. of U. S. (Econ. 4b)
 The Money Market (Econ. 8)
 (See also third year electives)

Farm Organization and Management

Students taking this course will be enrolled in the College of Agriculture and will receive the degree of Bachelor of Science from that College.

FIRST YEAR

Prescribed Subjects

	Hours
Chemistry 1.....	5
Rhetoric 1.....	3
Agromony 25.....	4

Prescribed Subjects

	Hours
Chemistry 2 and 3.....	5
Rhetoric 2.....	3
Animal Husbandry 5.....	3

Horticulture 1a.....	2	Dairy Husbandry 3.....	1
Agricultural Extension 4.....	3	Horticulture 1b.....	2
Military	1	Agricultural Extension 4.....	3
Physical Training.....	1	Military	2
		Physical Training.....	1

SECOND YEAR

<i>Prescribed Subjects</i>	<i>Hours</i>	<i>Prescribed Subjects</i>	<i>Hours</i>
Animal Husbandry 6.....	3	Agronomy 26.....	3
Military 2.....	1	Military 2.....	1

In addition to the above courses the following are also prescribed:

	<i>Hours</i>
Accountancy 11.....	2
Economics 2 or 1.....	2.5
Economics 16 (Sec. C).....	3
Economics 22.....	3
Economics 23.....	3
Economics 26.....	3
	—
	16-19 hours
Elective Economics, minimum of.....	6
	—
	22-25 hours
Farm Management 1.....	3
English 20.....	4
Philosophy 1.....	3
	—
	10
	—
	10 hours
Elective Science minimum.....	15
Elective Agriculture minimum.....	28
	—
	43
	—
	43 hours
Total prescribed.....	117-120 hours

Sufficient open electives should be chosen to complete the 130 hours required for graduation.

To avoid conflicts with other prescribed work it is suggested that the courses in Economics, Accountancy, and Farm Management be taken in the following order:

SECOND YEAR

Economics 26.....	3	Economics 22.....	3
Economics 2.....	2	Economics 16 (Sec. C).....	3

THIRD YEAR

Accountancy 11.....	2	Economics 14.....	2
		Farm Management 1.....	3

FOURTH YEAR

Economics 15.....	2	Economics 17.....	2
		Economics 23.....	3

IV. DIRECTIONS FOR STUDENTS IN JOURNALISM

Students who are preparing to enter the advertising or managerial sides of journalistic work should elect economics as a major and enroll in one of the business courses. The work they will take will then be selected under the ad-

vice of the proper instructors, according to the needs of the individual student and within the requirements of the College for graduation. Follow the directions for students in business courses, p. 22.

Students who are preparing for journalistic work on the reportorial, literary, or editorial sides should take their major work in English. They should make up their study schedules from the following suggested course. With the consent of the adviser, other courses may, for purposes of specialization, be substituted for suggested courses. A program which satisfies the group and major requirements may, for instance, be so modified in the third and fourth years as to lay emphasis on any one of the social sciences.

Students in journalism with major in English are subject to the requirements of the General Course in Liberal Arts and Sciences and should follow the directions for students in the General Course, using the outline below in connection with those directions. The directions for freshmen in the General Course are given on pages 13-15; those for students other than freshmen on pages 15-22.

The adviser for students in Journalism (with major in English) will be found in Room 208, University Hall.

Suggested Course in Journalism

(Major in English)

FIRST YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Rhetoric 1.....	3	Rhetoric 2.....	3
Physical training.....	1	Physical training.....	1
Military	1	Military	2
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Continental European History (Hist 1a).....	4	History 1b.....	4
Foreign language.....	4	Foreign language.....	4
English 10 or science.....	3 or 5	English 11 or science.....	3
General Reference (Library 12).....	2		

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Military	1	Military	1
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
News Writing (Rhetoric 12).....	2	News Writing (Rhetoric 13).....	2
English 1 or science.....	3 or 4 or 5	Foreign language continued.....	4
History of U. S. (Hist. 3a).....	3	History of U. S. (Hist. 3b).....	3
Foreign language continued.....	4	English 1 or State & Local Govt. (Pol. Sc. 3) (4 or 3) or Money and Banking (Econ. 3).....	3
Am. Nat'l. Gov't. (Pol. Sc. 1) or Principles of Economics (Econ. 1)	5	Shakespeare (English 23) or.....	3
Am. Literature (English 12).....	2	Literature (English 13).....	2

THIRD YEAR

Intermediate English.....	(3)	Intermediate English.....	(3)
Municipal Govt. (Pol. Sc. 4).....	3	Science	5
Foreign language continued.....	4	State & Local Govt. (Pol. Sc. 3) or Political Parties (Pol. Sc. 14).....	3 or 2
Logic (Philosophy 1).....	3	Intro. to Philosophy (Phil. 2).....	3
Rhetoric 15 or 6, or Psychology 1.....	3	Foreign language.....	4
Sociology 1.....	3	Rhetoric 16 or 17, or Psychology 1.....	3
		Sociology 1.....	3

FOURTH YEAR

Rhetoric 15 or English 27.....	3	Rhetoric 16 or English 28.....	3
Political Ethics (Phil. 9) or Const. Law (Pol. Sc. 5).....	3	Contemporary politics (Pol. Sc. 18 or 28)	2 or 3
History of U. S. (Hist. 21).....	3	Social & Indust. Legis. (Pol. Sc. 11).....	3
Public Finance, or Corporation Manage- ment and Finance, or Labor Problems (Econ. 5 or 10 or 12).....	3	Industrial Consolidation, or Economic His- tory of Europe or Socialism and Social Reform (Econ. 11 or 13 or 21).....	3

V. DIRECTIONS FOR STUDENTS IN HOUSEHOLD SCIENCE

The courses in instruction given in this department are planned to meet the needs of four classes of students: (a) those students who desire a knowledge of the general principles and facts of household science; (b) those students who wish to make a specialty of household science for the purpose of teaching the subject in secondary schools and colleges; (c) those students who wish some knowledge of the principles underlying household administration and institutional management; (d) those students who are interested in the work of dietitians.

The suggested courses for teachers and for institutional workers are outlined below. The electives of the junior and senior years of the course in administration make possible a choice between lunch room management and institutional management, while the first three years of the course as outlined for teachers give a scientific basis for the work of the dietitian.

Students who hold scholarships in household science must make this subject their major along one of the lines indicated above and take each semester at least four hours in household science or in subjects required for admission to courses in household science.

Students who major in household science must also satisfy the requirements of the General Course in the College of Liberal Arts and Sciences in so far as these are not covered in the courses given below, and should follow the directions for students in the General Course, using the outlines below in connection with those directions. The directions for freshmen in the General Course are given on pages 13-15; those for students other than freshmen on pages 15-22.

The adviser for students in Household Science will be found in Room 307, University Hall.

Suggested Course for Teachers of Household Science

FIRST YEAR

FIRST SEMESTER

Inorganic Chemistry (Chem. 1)
Home Architecture & Sanitation (Household
Science 2)
Introductory Zoology (Zool. 1)
Rhetoric & Themes (Rhet. 1)
Physical Training 7a
Hygiene (Physical Train. 9)

SECOND SEMESTER

*Principles of the Selection and Preparation
of Food (Household Sci. 1)
Inorganic Chemistry (Chem. 2)
Qualitative Analysis (Chem. 3)
Rhetoric & Themes (Rhet. 2)
Free Hand Drawing (Art & Design 1)
Physical Training 7b

*Attention is called to the fact that high school physics is a prerequisite for Household Science 1.

SECOND YEAR

Agricultural Analysis (Chem. 13a)	Organic Chemistry (Chem. 9)
Economic Uses of Food (Household Science 6)	Organic Synthesis (Chem. 9c)
Survey of English Literature (Eng. 1)	Household Art and Clothing (Household Science 12)
Applied Design (Art & Design 12)	Survey of English Literature (Eng. 2)
	Plane Trigonometry (Math. 4)

THIRD YEAR

Minor Course in Physiol. (Physiol. 4a)	Elementary Home Decoration (Household Science 3)
General Physics (Physics 7a-7b)	Dietetics (Household Science 5a-5b)
Physics Laboratory (Phys. 8a-8b)	Bacteriology (Bacteriology 5)
Principles of Economics (Econ. 2)	Foreign language
Foreign language	Electives
Electives	

FOURTH YEAR

Food and Nutrition (Household Science 4)	Teachers' Course (Household Sci. 11)
Principles of Education (Edu. 1)	Principles of Secondary Education or Observation and Technique of Teaching (Education 6 or 10)
History of Home Economics (Household Science 13)	Home Management (Household Science 10)
Electives	Electives

The following subjects are suggested as electives for the junior and senior years: Psychology 1, 2; Botany 1; foreign language.

Suggested Course in Household Administration

FIRST YEAR

FIRST SEMESTER	SECOND SEMESTER
Rhetoric and Themes (Rhet. 1)	Rhetoric and Themes (Rhet. 2)
Foreign language	Foreign language
Free Hand Drawing (Art & Design 1)	Art & Design 12
Home Architecture & Sanitation (Household Science 2)	Textiles (Household Science 7a-7b)
Hygiene (Physical Training 9)	Physical Training 7b
Physical Training 7a	
Electives	
Economic Resources (Econ. 26)	
General Reference (Lib. Sci. 12)	

SECOND YEAR

Inorganic Chemistry (Chem. 1)	*Principles of the Selection and Preparation of Food (Household Science 1)
Principles of Economics (Econ. 1)	Inorganic Chemistry (Chem. 2)
Foreign language or Eng. 1 or 20	Qualitative Analysis (Chem. 3)
<i>Suggested Electives</i>	Foreign language (if not completed)
Continental European History (Hist. 1a)	<i>Suggested Electives</i>
History of the United States (Hist 3a)	Continental European History (Hist. 1b)
History of the Fine Arts (Art & Design 19)	History of the United States (Hist. 3b)
English	English
	History of the Fine Arts (Art & Design 20)
	Economic History of the United States (Economics 22)

*Attention is called to the fact that high school physics is a prerequisite for Household Science 1.

THIRD YEAR

General Physiology (Physiol. 4a)
Economic Use of Food (Household Science 6)
Introduction to Psychology (Psychol. 1)

Suggested Electives

Principles of Sociology (Soc. 1)
Problems in Service of Food (Household Science 14a)
English
Agricultural Analysis (Chem. 13a)

Dietetics (Household Science 5a-5b)
Elementary Home Decoration (Household Science 3)
Household Management (Household Science 10)
Household Art and Clothing (Household Science 12)
General Psychology (Psychology 2)

Suggested Electives

State and Local Govern't. (Pol. Science 3)
Government of Illinois (Political Science 16)
Logic (Philosophy 1)
Organic Chemistry (Chem. 9 and 9c)

FOURTH YEAR

Suggested Electives

History of Home Economics (Household Science 13)
Economics of Family Group (Household Science 15)
Lunch Room Management (Household Science 18a)
Introduction to Bacteriology (Bacteriology 5)
English
Introduction to Education (Education 1)
Food and Nutrition (Household Science 4)

Suggested Electives

Teachers' Course (Household Science 11)
Problems in the Study of Textiles (Household Science 17)
Seminar (Household Science 9)
Observation and Technique (Education 10)
English

VI. DIRECTIONS FOR STUDENTS IN SCIENCE COURSES

(PREPARATORY TO MEDICINE; CHEMISTRY, CHEMICAL ENGINEERING; CERAMICS, CERAMIC ENGINEERING)

1. Look over the General Directions contained in paragraphs 1-26, page 5-II.
2. Freshmen who have already secured permits to register, and all other students who were in attendance the second semester of 1913-14 and are in good standing will obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Freshmen without permits, see paragraph 1, page 5. Other students not in attendance last semester or not in good standing, see paragraphs 4 and 5, page 6.
3. Report for registration to the third floor of the Natural History Building, south end. You will find your adviser in one of the following rooms, according to the course in which you are enrolling:
Course Preparatory to Medicine—Room 419.
Courses in Chemistry and Chemical Engineering—Room 420.
Courses in Ceramics and Ceramic Engineering—Room 422.
4. Follow, *point by point*, the directions on the first coupon of your study-list.
5. The outlines of the several courses follow.

Course Preparatory to Medicine

The following course of three years' work, outlined for students who are preparing for the study of medicine, includes the subjects offered in the first year of a standard course in medicine, with the exception of anatomy, together with the two years' work in arts and general science which is now required for admission to the better medical schools. Students who have completed the work of the first two years and are taking the work of the third year are registered for that year as medical students in the University of Illinois College of Medicine.

A student who has completed the course outlined below and who then completes a year's work in medicine in a recognized medical school may receive credit by transfer for this year of medical work, and thus receive the degree of Bachelor of Arts from the University of Illinois. Under this plan the student may obtain the degrees of Bachelor of Arts and Doctor of Medicine with six years' work.

FIRST YEAR			
FIRST SEMESTER	S. H.	SECOND SEMESTER	S. H.
General Chemistry (Chem. 1)-----	5	Descrip. Inorg. Chem. (Chem. 2)-----	2
Rhetoric (Rhet. 1)-----	3	Qualitative Analysis (Chem. 3)-----	3
Trigonometry (Math. 4)-----	2	Rhetoric 2-----	3
Zoology 1-----	5	Zoology 2-----	5
Military (Mil. 2a)-----	1	Military (1, 2b)-----	2
Physical Training-----	1	Physical Training-----	2
Total-----	17	Total-----	16
SECOND YEAR			
	S. H.		S. H.
German 1 or 4, or Latin-----	4	German 3 or 5 or 6, or Latin-----	4
Zoology 3-----	3	Zoology 6-----	3
Quantitative Analysis (Chem. 5a)-----	5	Organic Chem. (Chem. 9, 9c)-----	5
Physics 7a, 8a-----	4	Physics 7b, 8b-----	4
Military 2c-----	1	Military 2d-----	1
Total-----	17	Total-----	17
THIRD YEAR			
German 4-----	4	German 5 or 6-----	4
Histology (Physiology 1)-----	5	Physiology 2-----	7
Physiological Chem. (Chem. 15)-----	7	Physiology 6-----	3
Psychology 1-----	3	Medical Bacteriology (Bacteriology 26)-----	5
Total-----	19	Total-----	19

FOURTH YEAR

No group requirements are *prescribed* for students who have completed the three years' course and desire to remain at the University the fourth year. Selection from the following courses is recommended: Bacteriology; Chemistry 5b, 5c, 9a, 9b, 14a-14b, 21, 22, 31, 105, and 106; Entomology 2, 3; Physiology 5a-5b; Psychology 113; Zoology 7, 8a-8b, 13, 14a-14b; modern languages; and studies included in Group 5 of the general course in science. Upon the completion of this fourth year, the student takes his baccalaureate degree before going to the college of medicine.

¹Semester hours. For definition see page 76.

²If Latin has not been offered for entrance.

Course in Chemistry

A student may follow the General Course in the College of Liberal Arts and Sciences with chemistry as a major subject. To do this, follow the directions given, for freshmen on pages 13-15; for students other than freshmen on pages 15-22. Such a course leads to the degree of Bachelor of Arts.

For the more specialized training of the chemist the following course, largely prescribed, has been arranged. It leads to the degree of Bachelor of Science in chemistry.

Preliminary preparation in German equivalent to two years of high school work or one year of university work is advised. Students who are unable to offer this may take German 1 and 3 in the freshman year, but will be required to take German 4 and 5 or 6 in place of other electives.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	S. H. ¹		S. H. ¹
General Elementary Chemistry (Chem. 1).....	5	Analytical Geometry (Math. 6).....	5
Trigonometry (Math. 4).....	2	Descriptive Inorganic Chemistry (Chem. 2).....	2
Advanced Algebra (Math. 2).....	3	Qualitative Analysis (Chem. 3).....	3
German 4.....	4	German 5 or 6.....	4
Military (Mil. 2a).....	1	Military 2b.....	1
Gymnasium (Phys. Tr.).....	1	Drill Regulations.....	1
		Gymnasium (Phys. Tr.).....	1
Total.....	16	Total.....	17

SECOND YEAR

	S. H.		S. H.
French 1a.....	4	French 1b.....	4
Quantitative Anal. (Chem. 5a).....	5	Advanced Anal. Chem. (Chem. 5b).....	5
Physics 1a, 3a.....	5	Rhetoric 2.....	3
Rhetoric 1.....	3	Physics 1b, 3b.....	4
Military (Mil. 2c).....	1	Military (Mil. 2d).....	1
Total.....	18	Total.....	17

THIRD YEAR

	S. H.		S. H.
Mineralogy (Geology 5).....	5	Organic Chemistry (Chem. 14b, 9b).....	5
Organic Chemistry (Chem. 14a, 9a).....	5	Physical Chem. (Chem. 31, 33).....	5
Journal Meeting (Chem. 92a).....	1	Journal Meeting (Chem. 92b).....	1
Economics.....	2	Electives.....	3
Differential and Integral Calculus (Math. 7).....	5	English 1-2 or History 3a-3b.....	4
Total.....	18	Total.....	18

FOURTH YEAR

	S. H.		S. H.
Journal Meeting (Chem. 93a).....	1	Journal Meeting (Chem. 93b).....	1
Thesis.....	5	Ind. Chem. (Chem. 61 or Chem. 6).....	2
Electives in Chem.....	5	Thesis.....	5
Electives, history, economics or equivalent.....	5	Electives.....	8
Total.....	16	Total.....	16

The electives of the junior year and ten hours of the electives of the senior year must be taken elsewhere than in the department of chemistry. Some biological subject, philosophy, history, and economics are recommended.

¹Semester hours. For definition see page 76.

Course in Chemical Engineering

The work of the technical chemist or superintendent is frequently so closely associated with mechanical and other engineering lines as to make a knowledge of these subjects essential. To meet these conditions, the following four-year course in chemistry and related engineering subjects has been arranged. The degree given is that of Bachelor of Science in chemical engineering.

Preliminary preparation in German equivalent to two years of high school or one year of university work is *prescribed*. It is also advised that students intending to take this course be prepared to offer mechanical drawing and manual training for entrance.

Where this preliminary training is lacking, students are advised, if possible, to register in shop work and general engineering drawing during the early years of their course.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	S. H. ¹		S. H. ¹
General Elementary Chemistry (Chem. 1).....	5	Analytical Geometry (Math. 6).....	5
Trigonometry (Math. 4).....	2	Descriptive Inorganic Chemistry (Chem. 2).....	2
Advanced Algebra (Math. 2).....	3	Qualitative Analysis (Chem. 3).....	3
German 4.....	4	German 5 or 6.....	4
Military 2a.....	1	Military (Mil. 2b).....	1
Gymnasium (Phys. Tr.).....	1	Drill Regulations (Mil. 1).....	1
	—	Gymnasium (Phys. Tr.).....	1
Total.....	16	Total.....	17

SECOND YEAR

S. H.		S. H.	
Differential and Integral Calculus (Math. 7).....	5	Analytical Mech. (T. & A. M. 20).....	3
Quantitative Anal. (Chem. 5a).....	5	Advanced Analytical Chemistry (Chem. 5b).....	5
Physics 1a, 3a.....	5	Rhetoric 2.....	3
Rhetoric 1.....	3	Physics 1b, 3b.....	4
Military (Mil. 2c).....	1	Economics 22.....	3
	—	Military (Mil. 2d).....	1
Total.....	19	Total.....	19

THIRD YEAR

S. H.		S. H.	
Gas and Fuel Anal. (Chem. 65).....	2	Physical Chem. (Chem. 31, 33).....	5
Mineralogy (Geol. 5).....	5	Organic Chem. (Chem. 14b, 9b).....	5
Analytical Mech. (T. & A. M. 21).....	2½	Dynamo Electric Machinery (E. E. 11).....	4
Resistance of Mater. (T. & A. M. 29).....	3½	Journal Meeting (Chem. 92b).....	1
Organic Chem. (Chem. 14a, 9a).....	5		—
Journal Meeting (Chem. 92a).....	1		—
Total.....	19	Total.....	15

FOURTH YEAR

Hours		Hours	
Met. Lab. and Assaying (Chem. 69).....	2	Electives in Chemistry.....	3
Electro-chemistry (Chem. 35).....	3	Thesis (Chem. 11b).....	5
Alternating Currents (E. E. 12).....	2	Chemical Technology (Chem. 6).....	2
Metallurgy (Chem. 7).....	2	Industrial Chemical Lab. (Chem. 61).....	2
Thesis (Chem. 11a).....	5	Journal Meeting (Chem. 93b).....	1
Journal Meeting (Chem. 93a).....	1	Economics or Philosophy.....	3
	—		—
Totals.....	15	Totals.....	16

¹Semester hours. For definition see page 76.

Courses in Ceramics and Ceramic Engineering

To graduate with the degree of Bachelor of Science in ceramics the student must follow one of the courses outlined below. The conditions are such that little election can be allowed.

Special courses will be arranged for those who wish a limited amount of work in ceramics, but those pursuing them will not be entitled to a degree and will not be recognized as graduates.

Course in Ceramics

FIRST SEMESTER		FIRST YEAR		SECOND SEMESTER	
	S. H. ¹				S. H. ¹
Chemistry 1b.....	4	Chemistry 4.....	4		
Math. 2—Advanced Algebra.....	3	Math. 6—Analyt. Geom.....	5		
Math. 4—Trigonometry.....	2	G. E. D. 2—Descript. Geom.....	4		
General Eng. Drawing 1.....	4	Rhetoric 2.....	3		
Rhetoric 1.....	3	Military 2b—Military Drill.....	1		
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1		
Phys. Tr. 1—Gymnasium.....	1	Phys. Tr. 2—Gymnasium.....	1		
	<hr/> 18				<hr/> 19
SECOND YEAR					
Physics 1a and 3a.....	5	Physics 1b and 3b.....	4		
Chemistry 5a.....	5	Chemistry 5b.....	5		
Math. 8 (Calculus).....	5	T. & A. M. 14—Elements of Mechanics.....	4		
Military Drill.....	1	Cer. 1—Ceramic Materials.....	3		
	<hr/> 16	Military Drill.....	1		
			<hr/> 17		
THIRD YEAR					
German 4 or French 1a or 2a.....	4	German 6 or French 1b or 2 b.....	4		
Cer. 2—Winning and Preparation.....	3	Cer. 5—Ceramic Bodies.....	5		
Cer. 3—Industrial Calculations.....	3	Cer. 12—Designing and Shaping.....	3		
T. & A. M. 15—Strength of Materials.....	3	Cer. 17—Silicates.....	3		
Chemistry 65.....	2	C. E. 96—Surveying.....	2		
	<hr/> 15		<hr/> 17		
FOURTH YEAR					
Geol. 13a—Engineering Geology.....	3	Geol. 13b—Engineering Geology.....	3		
Cer. 6—Glazes.....	5	Cer. 8—Glass.....	2		
Cer. 10—Cements.....	3	M. E. 2—Steam Engines & Boilers.....	3		
Cer. 4—Drying and Burning.....	4	Cer. 9—Ceramic Construction.....	4		
Mining 3.....	2	Cer. 11—Thesis.....	5		
	<hr/> 17		<hr/> 17		

Course in Ceramic Engineering

FIRST SEMESTER		FIRST YEAR		SECOND SEMESTER	
	S. H. ¹				S. H. ¹
Chemistry 1b.....	4	Chemistry 4.....	4		
Math. 2—Adv. Algebra.....	3	Math. 6—Analyt. Geom.....	5		
Math. 4—Trigonometry.....	2	G. E. D. 2—Descript. Geom.....	4		
Gen. Eng. Drawing 1.....	4	Rhetoric 2.....	3		
Rhetoric 1.....	3	Mil. 2b—Military Drill.....	1		
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1		
Ph. Tr. 1—Gymnasium.....	1	Ph. Tr. 2—Gymnasium.....	1		
	<hr/> 18				<hr/> 19

¹Semester hours. For definition see page 76.

SECOND YEAR

Physics 1a and 3a.....	5	Physics 1a and 3a.....	4
Chemistry 5a.....	5	Chemistry 5b.....	5
Math. 7—Calculus.....	5	Math. 9—Calculus.....	3
Military Drill.....	1	T. & A. M. 20—Elements of Mechanics.....	3
		Cer. 1—Ceramic Materials.....	3
		Military Drill.....	1
	16		19

THIRD YEAR

German 4 or French 1a or 2a.....	4	German 6 or French 1b or 2b.....	4
Cer. 2—Winning & Preparation.....	3	Cer. 5—Ceramic Bodies.....	5
Cer. 3—Industrial Calculations.....	3	Cer. 12—Designing & Shaping.....	3
T. & A. M. 21—Analytical Mechanics.....	2	Cer. 17—Silicates.....	3
T. & A. M. 25—Resist. of Materials.....	4	C. E. 96—Surveying.....	2
	16		17

FOURTH YEAR

Geol. 13a—Engineering Geology.....	3	Geol. 13b—Engineering Geology.....	3
Cer. 6—Glazes.....	5	Cer. 9—Ceramic Construction.....	4
Cer. 10—Cements.....	3	Cer. 8—Glass.....	2
Cer. 4—Drying and Burning.....	4	M. E. 2—Steam Engines & Boilers.....	3
Min. 3—Mining Methods.....	2	Cer. 11—Thesis.....	3
	17		15

VII. SUMMARY OF CLASS ADVISERS

Approval of the course of study selected must be secured from the class adviser in room and building indicated below:

1. *Business Administration* (regardless of class).....
.....Room 103, Commerce Bldg.
2. Students whose major work is to be in *language, economics* (not business), *education, English, history, philosophy, political science, psychology, or sociology*:
 - (a) Freshmen and sophomores.....Room 208, University Hall
 - (b) JuniorsRoom 302, University Hall
 - (c) Seniors (including all students who plan to graduate next June)Room 308, University Hall
3. Students whose major work is to be in *astronomy, botany, chemistry*, (general), *entomology, geology, mathematics, physics, physiology* (not medicine), or *zoology*, all classes..Room 418, Nat. Hist. Bldg.
4. *Course Preparatory to Medicine*.....Room 419, Nat. Hist. Bldg.
5. *Chemistry and Chemical Engineering*.....Room 420, Nat. Hist. Bldg.
6. *Ceramics and Ceramic Engineering*.....Room 422, Nat. Hist. Bldg.
7. *Household Science*Room 307, University Hall
8. *Specials* (a) in *business*Room 103, Commerce Bldg.
 (b) in *Courses indicated under 2 or 3 above*.....
Room 315, University Hall
 (c) in *Household Science*Room 307, University Hall
 (d) in *other courses (medicine, chemistry, ceramics)*....
in rooms indicated above, according to course.

Advisers to whom students are to go during the year for advice and assistance will be announced upon the bulletin boards or by mail shortly after registration.

VIII. HEADQUARTERS OF DEPARTMENTS

The headquarters of the different departments, where the heads or their representatives may be consulted during the registration period, are as follows:

U. H. = University Hall; N. H. = Natural History Hall; L. H. = Lincoln Hall; Com. = Commerce Building.

Accountancy	Room 101 Com.
Art and Design	Room 405 U. H.
Astronomy	Room 421 N. H.
Botany	Room 209 N. H.
Business Administration	Room 101 Com.
Ceramics	Room 422 N. H.
Chemistry	Room 102 Chem.
Comparative Philology	Room 313 U. H.
Economics	Room 111 Com.
Economics (for Business Students)	Room 101 Com.
Education	Room 203 U. H.
English	Room 323 U. H.
Entomology	Room 223 N. H.
French	Room 309 U. H.
Geology	Room 244 N. H.
German	Room 313 U. H.
Greek	Room 126 L. H.
History	Room 414 U. H.
Household Science	Room 307 U. H.
Italian	Room 309 U. H.
Journalism (English)	Room 323 U. H.
Latin	Room 126 L. H.
Mathematics	Room 334 N. H.
Philosophy	Room 119 L. H.
Physics	Room 203 Phys. Lab.
Physiology	Room 419 N. H.
Political Science	Room 414 U. H.
Psychology	Room 213 U. H.
Rhetoric	Room 323 U. H.
Scandinavian	Room 209 L. H.
Sociology	Room 318 L. H.
Spanish	Room 309 U. H.
Zoology	Room 301 N. H.

THE COLLEGE OF ENGINEERING

Engineering students should read the General Directions given in paragraphs 1-26 on pages 5-11. Further special directions will be furnished them with their study-lists.

The several engineering courses are in process of transition between a former schedule followed by the classes entering prior to the present year and a new schedule which will be effective for this year's freshman class and subsequent classes.

The outlines which follow show the work of each year in the several courses *as taught during 1914-15*. They do not show either the old or the new curriculum as a whole. Freshmen will take the "First Year" as here scheduled; and regular sophomores, juniors, and seniors will take the "Second Year," "Third Year," and "Fourth Year," respectively; but these schedules *must not be used* for checking up on a student's previous work in his course or in planning the work of subsequent years. For such check or planning consult with your adviser.

Course in Architecture as Taught 1914-15

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Math. 4 ² —Trigonometry.....	2	Chem. 1a ³ or 1b—Inorg. Chem.....	4
Math. 2—Advanced Algebra.....	3	T. & A. M. 14—Elem. Mech.....	4
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
G. E. D. 2—Descriptive Geometry.....	4	Arch. 32—Arch. and Freehand Drawing....	4
Arch. 31—Arch. and Freehand Drawing....	4	Mil. 2b—Military Drill.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
Phys. Tr. 1—Gymnasium.....	1	Phys. Tr. 2—Gymnasium.....	1
Total.....	18	Total.....	18

SECOND YEAR

Phys. 9a—Physics Lectures.....	2	Phys. 9b—Physics Lectures.....	2
Phys. 10a—Physics Laboratory.....	2	Phys. 10b—Physics Laboratory.....	2
T. & A. M. 15—Strength of Mater.....	3	T. & A. M. 16—Strength of Mater.....	3
Arch. 13—History of Arch.....	2	Arch. 14—History of Arch.....	2
Arch. 23—Freehand Drawing.....	2	Arch. 24—Freehand Drawing.....	2
Arch. 33—Design.....	3	Arch. 34—Design.....	3
Arch. 43—Working Drawings.....	3	Arch. 44—Working Drawings.....	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Total.....	18	Total.....	18

¹For definition see page 76.

²The numbers refer to courses in the Description of Courses, page 76.

³Students who have had chemistry in the high school equivalent to Chemistry 1b will register in Chemistry 1a.

THIRD YEAR

French or German.....	4	French or German.....	4
Arch. 15—History of Arch.....	2	Arch. 16—History of Arch.....	2
Arch. 25—Freehand Drawing.....	2	Arch. 26—Freehand Drawing.....	2
Arch. 35—Design.....	5	Arch. 36—Design.....	5
Arch. 45—Graphic Statics.....	3	Arch. 46—Graphic Statics.....	3
Arch. 55—Building Sanitation.....	1	E. E. 9—Building Illumination.....	1
Arch. 65—Theory of Arch.....	1	Arch. 66—Theory of Arch.....	1
Total.....	18	Total.....	18

FOURTH YEAR

Arch. 27—Freehand Drawing.....	2	Arch. 28—Freehand Drawing.....	2
Arch. 37—Design.....	7	Arch. 38—Adv'd Design or Thesis.....	7
Arch. 67—Theory of Form & Color.....	2	Arch. 60—Estimating.....	1
M. E. 26—Heating & Ventilation.....	2	Arch. 68—Specifications.....	3
L. A. & S. Option.....	3	L. A. & S. Option.....	3
Econ. 2—Prin. of Econ.....	2		
Total.....	18	Total.....	16

Course in Architectural Engineering, as Taught 1914-15

FIRST YEAR

FIRST SEMESTER

	Hours ¹
A. E. 31 ² —Arch. and Freehand Drawing.....	4
Language.....	4
Math. 2—Advanced Algebra.....	3
Math. 4—Trigonometry.....	2
Rhet. 1—Rhetoric and Themes.....	3
Mil. 2a—Drill.....	1
Phys. Train. 1—Gymnasium.....	1
Total.....	18

SECOND SEMESTER

	Hours ¹
G. E. D. 2 ² —Descriptive Geometry.....	4
Language.....	4
Math. 6—Analytical Geometry.....	5
Rhet. 2—Rhetoric and Themes.....	3
Mil. 1—Drill Regulations.....	1
Mil. 2b—Drill.....	1
Phys. Train. 2—Gymnasium.....	1
Total.....	19

SECOND YEAR

Arch. 13 (6)—History of Arch.....	2	Arch. 14 (6)—History of Arch.....	2
A. E. 33—Arch. and Freehand Drawing.....	3	A. E. 34—Freehand Drawing.....	3
A. E. 43—Working Drawings.....	2	A. E. 44—Working Drawings.....	2
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Physics 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Physics 3b—Physics Laboratory.....	2
Mil. 2c—Drill.....	1	T. & A. M. 20—Analytical Mech.....	3
	—	Mil. 2d—Drill.....	1
Total.....	18	Total.....	18

THIRD YEAR

Arch. 6a—History of Arch.....	4	Arch. 6b—History of Arch.....	4
Arch. 11a—Arch. Seminar.....	1	Arch. 11b—Arch. Seminar.....	1
A. E. 45—Graphic Statics.....	3	A. E. 46 (5)—Graphic Statics.....	3
Chem. 1—Inorganic Chemistry.....	4	Liberal Arts option.....	2
Econ. ² —Principles of Economics.....	2	M. E. 1—Steam Engines and Boilers.....	2
T. & A. M. 25 (9)—Res. of Materials.....	4	T. & A. M. 26 (8)—Analytical Mech.....	4
Total.....	18	Total.....	16

¹For definition see page 76.²The numbers refer to courses in the Description of Courses, page 76. Numbers in parenthesis are old numbers.

FOURTH YEAR

Arch. 34a—Arch. Eng. Seminar.....	1	Arch. 68—Specifications	3
A. E. 47 (19)—Arch. Engineering.....	5	A. E. 48 (19)—Structures	5
A. E. 57—Fireproof Construction.....	2	A. E. 58—Fireproof Construction.....	2
Liberal Arts option.....	3	E. E. 92 (9)—Electric Lighting.....	2
M. E. 26—Heating and Vent.....	3	Liberal Arts option	3
M. E. 67—Heating and Vent. Lab.....	1		—
Total	15	Total	15

Civil Engineering Course, as Taught 1914-15

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1 ² —Inorganic Chemistry.....	4	Chem. 2 & 3—Inorganic Chemistry.....	4
G. E. D. 1—Gen. Eng. Dwg.....	4	G. E. D. 2—Descrip. Geom.....	4
Language	4	Language	4
Math. 2—Adv. Algebra.....	3	Math. 6—Anal. Geom.....	5
Math. 4—Trigonometry.....	2	Mil. 1—Drill Reg.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Total	19	Total	20

SECOND YEAR

C. E. 27—Surveying.....	3	C. E. 28—Top Surveying.....	3
Math. 7—Diff. Calculus.....	5	Math. 9—Int. Calculus.....	3
Phys. 1a (1)—Physics Lect.....	3	Phys. 1b (1)—Physics Lect.....	2
Phys. 3a (3)—Physics Lab.....	2	Phys. 3b (3)—Physics Lab.....	2
Rhet. 1—Rhet. & Themes.....	3	Rhet. 2 (1)—Rhet. & Themes.....	3
Mil. 2c—Military Drill.....	1	T. & A. M. 20 (7)—Anal. Mech.....	3
Elective	2	Mil. 2d—Military Drill.....	1
	—	Elective	2
Total	19	Total	19

THIRD YEAR

Chem. (1b ³ or 1a)—Inorganic Chem.....	4	C. E. 1a-1b (1)—Road Engineering.....	3
C. E. 51—R. R. Surveying.....	5	C. E. 62—Structural Details	3
M. E. 1 (11)—Steam Engines and Boilers	3	C. E. 60—Structural Stresses	3
T. & A. M. 21 (8)—Anal. Mech.....	2½	C. E. 70—Seminar.....	1
T. & A. M. 29 (9)—Res. of Matls.....	4½	T. & A. M. 10 (10)—Hydraulics.....	3
	—	Non-technical elective	3
Total	19	Total	16

FOURTH YEAR

C. E. (5r)—Masonry Const.....	4	C. E. (6)—Masonry & Reinforced Con- crete Design	2
C. E. (5l)—Cement Lab.	1	C. E. (14)—Bridge Design.....	5
C. E. (12)—Bridge Anal.	2	*C. E. (15)—Adv. Bridge Anal.....	2
C. E. 62 (13)—Bridge Details.....	2	C. E. (16)—Eng. Cont. & Spec.....	2
C. E. (18)—Theory of Reinforced Con- crete	1	C. E. 70 (25)—Seminar.....	1
*C. E. 31 (24)—Metal Struct.....	2	C. E. 100 (30)—Thesis.....	2
C. E. 99 (30)—Thesis.....	1	M. & S. E. (3)—Sewerage ⁴	3
M. & S. E. (2)—Water Supply Engineer- ing	4		—
Total	17	Total	17

¹For definition see page 76.²The numbers refer to courses in the Description of Courses, page 76. Numbers in parenthesis are old numbers.³Students who have had chemistry in the high school equivalent to Chemistry 1b will register in Chemistry 1a; those who have received credit for Chemistry 1a will register in Electrical Engineering 3 and 22.⁴A limited number of students may elect Highway Engineering (2 hrs.) instead.

Electrical Engineering Course, as Taught 1914-15

FIRST YEAR

FIRST SEMESTER

	Hours ¹
G. E. D. 1 ² —Gen. Eng. Draw.....	4
Math. 2—Algebra.....	3
Math. 4—Trigonometry.....	2
M. E. 75 (41)—Shop Practise.....	3
Rhet. 1—Rhet. & Themes.....	3
Mil. 2a—Military Drill.....	1
P. T. 1—Gymnasium.....	1
Total.....	17

SECOND SEMESTER

	Hours ¹
G. E. D. 2 ² —Descr. Geom.....	4
Math. 6—Analyt. Geometry.....	5
M. E. 77 (41)—Shop Practise.....	3
Rhet. 2—Rhet. & Themes.....	3
Mil. 1—Drill Regulations.....	1
Mil. 2b—Military Drill.....	1
P. T. 2—Gymnasium.....	1
Total.....	18

SECOND YEAR

Math. 7—Diff. Calculus.....	5
M. E. 79 (42)—Machine Shop.....	3
Phys. 1a—Physics Lect.....	3
Phys. 3a—Physics Lab.....	2
Rhet. 1—Rhet. & Themes.....	3
Mil. 2c—Military Drill.....	1
Total.....	17

Chem. 1—Inorg. Chem.....	4
Math. 9—Integral Calc.....	3
Phys. 1b—Physics Lect.....	2
Phys. 3b—Physics Lab.....	2
Rhet. 2—Rhet. & Themes.....	3
T. A. M. 20 (7)—Anal. Mech.....	3
Mil. 2d—Military Drill.....	1
Total.....	18

THIRD YEAR

Chem. 4—Adv. Chem.....	4
E. E. 25—Dynamo Elec. Mach.....	4
E. E. 22—Elect. Eng. Lab.....	2
Math. 9a—Integral Calculus.....	2
Phys. 4a—Elect. & Mag. Meas.....	2
T. A. M.....	4
Total.....	18

E. E. 5—Alt. Currents.....	4
E. E. 23—Elec. Eng. Lab.....	2
M. E. 2—Steam Engines.....	3
Phys. 4b—Elec. & Mag. Meas.....	2
T. A. M.....	4
Total.....	15

FOURTH YEAR

E. E. 14—Adv. Alt. Currents.....	4
E. E. 24—Elec. Eng. Lab.....	2
E. E. 32—Electrical Design.....	2
M. E. 11—Thermodynamics ³	3
M. E. 23—Steam Engines ³	2
Non-technical elective.....	3
Total.....	17

E. E. 95—Seminar.....	1
E. E. 96—Seminar.....	1
E. E. 17—Adv. Alt. Currents.....	4
E. E. 27—Elec. Eng. Lab.....	2
E. E. 56—El. Des. & Power Pl.....	4
E. E. 35—Thesis or elective.....	3
Non-technical elective.....	3
Total.....	17

Mechanical Engineering Course, as Taught 1914-15

FIRST YEAR

FIRST SEMESTER

	Hours ¹
Chem. (1) ² —Inorg. Chem.....	4
G. E. D. (1)—Gen. Eng. Draw.....	4
Language.....	4
Math. (2)—Algebra.....	3
Math. (4)—Trigonometry.....	2
Mil. 2a (2)—Mil. Drill.....	1
P. T. (1)—Gymnasium.....	1
Total.....	19

SECOND SEMESTER

	Hours ¹
Chem. (4) ² —Adv. Chem.....	4
G. E. D. (2)—Desc. Geom.....	4
Language.....	4
Math. (6)—Anal. Geom.....	5
Mil. (1)—Drill Reg.....	1
Mil. 2b (2)—Mil. Drill.....	1
P. T. 2 (1)—Gymnasium.....	1
Total.....	20

¹For definition see page 76.²The numbers refer to courses in the Description of Courses, page 76. Numbers in parenthesis are old numbers.³As given in previous years.

SECOND YEAR

Math. (7) ¹ —Diff. Calculus.....	5	Math. (9)—Int. Calculus.....	3
M. E. 77 (42)—Machine Shop.....	3	M. E. 79 (42)—Machine Shop.....	2
M. E. (4)—Machine Design.....	2	M. E. 2 (16)—Steam Eng'g.....	3
Physics 1a (1)—Phys. Lectures.....	3	Phys. 1b (1)—Phys. Lectures.....	2
Phys. 3a (3)—Phys. Lab.....	2	Phys. 3b (3)—Phys. Lab.....	2
Rhet. (1)—Rhet. & Themes.....	3	Rhet. 2 (1)—Rhet. & Themes.....	3
Mil. 2c (2)—Military Drill.....	1	T. A. M. 20 (7)—Anal. Mech.....	3
—	—	Mil. 2d (2)—Mil. Drill.....	1
Total.....	19	Total.....	19

THIRD YEAR

Chem. (1)—Inorg. Chem.....	4	Chem. 16 (16)—Eng'g. Chem.....	3
Math. (9a)—Int. Cal.....	2	M. E. 64 (3)—Power Meas.....	3
T. & A. M. 21 (8)—Anal. Mech.....	4	M. E. 12 (7)—Thermodynamics.....	5
T. & A. M. 29 (9)—Res. of Materials.....	4	M. E. (32)—Mech. of Mach.....	5
Non-technical elective.....	3	—	—
Total.....	17	Total.....	16

FOURTH YEAR

Econ. (2)—Prin. of Econ.....	2	Econ. 16 (16)—Econ. Prob.....	2
E. E. 12 (6)—Alt. Cur.....	2	E. E. 29 (29)—Alt. Cur. Lab. or C. E. 96	2
M. E. 6a (6)—Heat Engines.....	3	Surveying.....	2
M. E. (8)—Mech. of Mach.....	3	M. E. 2 (16)—Heat Engines.....	2
M. E. 43 (9)—Mach. Design.....	3	M. E. 52 (14)—Design of Power Plants.....	3
M. E. 65 (12)—Mech. Lab.....	3	M. E. 26 (38)—Heat & Vent.....	3
M. E. 19 (19)—Seminar.....	1	M. E. 99 (33)—Thesis or elective.....	3
—	—	—	—
Total.....	17	Total.....	15

Mining Engineering Course, as Taught, 1914-15

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ²		Hours ²
Chem. 1—Inorganic Chemistry.....	4	Chem. 2—Inorganic Chemistry.....	2
G. E. D. 1—General Eng. Drawing.....	4	Chem. 3—Qualitative Analysis.....	2
Math. 2—Advanced Algebra.....	3	G. E. D. 12—Descriptive Geometry.....	3
Math. 4—Trigonometry.....	2	Math. 6—Analytical Geometry.....	5
Rhet. 1—Rhetoric and Themes.....	3	Mining Eng. 1—Earth and Rock Excav.....	1
Mil. 2a—Drill.....	1	Rhet. 2—Rhetoric and Themes.....	3
Phys. Train. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
—	—	Mil. 2b—Drill.....	1
—	—	Phys. Train. 2—Gymnasium.....	1
Total.....	18	Total.....	19

SECOND YEAR

Chem. 1b or 1a—Inorganic Chemistry.....	4	Chem. 2—Inorganic Chemistry.....	2
Math. 7—Differential Calculus.....	5	Chem. 3—Qualitative Analysis.....	3
Mining Eng. 1—Earth and Rock Excav.....	1	Math. 9—Integral Calculus.....	3
Physics 1a—Physics Lectures.....	5	Physics 1b—Physics Lectures.....	4
Physics 3a—Physics Laboratory.....	—	Physics 3b—Physics Laboratory.....	—
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Mil. 2c—Drill.....	1	T. & A. M. 20—Analyt. Mechanics.....	3
—	—	Mil. 2d—Drill.....	1
Total.....	19	Total.....	19

¹The numbers refer to courses in the Description of Courses, page 76. Numbers in parenthesis are old numbers.

²For definition see page 79.

THIRD YEAR

Chem. 5a—Elem. Qual. Analysis.....	4	C. E. 60—Graphic Statics.....	2
C. E. 27—Surveying.....	3	E. E. (X).....	5
M. E. 1—Steam Engin.....	3	Geol. 13b—Engin. Geology.....	3
Geol. 13a—Engin. Geology.....	3	Min. Eng. 3—Mining Methods.....	2
T. & A. M. 25 (25)—Res. of Materials..	4	T. & A. M. 26 (26)—Kinetics and Hy- draulics	4
Total.....	17	Total.....	16

FOURTH YEAR

Chem. 7—Metallurgy.....	3	E. E. (X).....	3
Chem. 65—Gas and Fuel Analysis.....	2	Geol. 2—Economic Geology.....	3
Chem. 69—Assaying, or Geol. 21—Geology of Coal.....	2	Mining Eng. 6b.....	3
Mining Eng. 6a—Mech. Eng. of Mines.....	3	Mining Eng. 8—Mine Administration.....	2
Mining Eng. 9—Prep. of Coal and Ores..	3	Mining Eng. 64.....	2
Mining Eng. 41.....	3	Mining Eng. 100 (or approved Elec.).....	3
Total.....	16	Total.....	16

Municipal and Sanitary Engineering Course, as Taught, 1914-15

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1 ² —Inorg. Chem.....	4	Chem. 2, 3 ² —Inorg. & Anal.....	4
G. E. D. 1—Drawing.....	4	G. E. D. 2—Descrip. Geom.....	4
Language	4	Language	4
Math. 2—Adv. Algebra.....	3	Math. 6—Anal. Geometry.....	5
Math. 4—Trigonometry.....	2	Mil. 1—Drill Regulations.....	1
Mil. 2a—Drill.....	1	Mil. 2b—Drill.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Total.....	19	Total.....	20

SECOND YEAR

C. E. 27—Surveying.....	3	C. E. 28—Surveying.....	3
Math. 7—Diff. Calculus.....	5	Math. 9—Int. Calculus.....	3
Physics 1a—Physics Lect.....	3	Physics 1b—Phys. Lect.....	2
Physics 3a—Physics Lab.....	2	Physics 3b—Phys. Lab.....	2
Rhet. 1—Rhet. & Themes.....	3	Rhet. 2—Rhet. and Themes.....	3
Mil. 2c—Drill.....	1	T. A. M. 20—Anal. Mech.....	3
Total.....	17	Mil. 2d—Drill.....	1
		Total.....	17

THIRD YEAR

Chem. 1b or 1a—Inorg. Chem.....	4	Chem. 2, 3, 10b—Qual. & Water Anal.....	5
C. E. 53—R. R. Surveying.....	3	C. E. 52—Road Eng.....	2
Bacteriology 6.....	2	C. E. 60—Structural Stresses.....	3
T. & A. M. 21—Anal. Mech.....	2.5	C. E. 62—Struc. Details.....	3
T. & A. M. 25—Res. of Mat.....	4.5	M. E. 23—Steam. Eng.....	3
Total.....	16	T. & A. M. 10—Hydraulics.....	3
		Total.....	19

¹For definition see page 76.²The numbers refer to courses in the Description of Courses, page 76. Numbers in parenthesis are old numbers.

FOURTH YEAR

M. & S. E. 2—Water Supp. Eng.	4	M. & S. E. 3—Sewerage	3
M. & S. E. 6a—Water Pur.	3	M. & S. E. 6b—Water Pur.	2
C. E. 5—Masonry	5	M. & S. E. 9—Hydraulics	2
C. E. 12—Bridge Anal.	2	M. & S. E. 30—Thesis	2
C. E. 13—Bridge Details	2	C. E. 6b—Mas. & Reinf. Conc.	2
E. E. 64—Elec. Eng.	1	M. E. 61—Mech. Eng. Lab.	2
	—	Econ. 2—Prin. of Econ.	2
Total	17	Total	17

Railway Civil Engineering Course, as Taught 1914-15

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chemistry	4	Chemistry	4
G. E. D. (1) ² —Gen. Eng. Draw.	4	G. E. D. (2) ² —Descrip. Geom.	4
Math. (4)—Trigonometry	2	Math. (6)—Analyt. Geom.	5
Math. (2)—Adv. Algebra	3	Rhet. 2 (1)—Rhet. & Themes	3
Rhet. (1)—Rhet. & Themes	3	Mil. 2b (2)—Mil. Drill	1
Mil. 2a (2)—Mil. Drill	1	Mil. (1)—Drill Regulations	1
P. T. (1)—Gymnasium	1	P. T. 2 (1)—Gymnasium	1
Total	18	Total	19

SECOND YEAR

Chemistry	4	Chemistry	4
C. E. 27 (21)—Surveying	3	C. E. 28 (22)—Top. Surveying	3
Math. (7)—Diff. Calculus	5	Math. (9)—Int. Calculus	3
Phys. 1a (1)—Phys. Lectures	3	Phys. 1b (1)—Phys. Lectures	2
Phys. 3a (3)—Phys. Lab.	2	Phys. 3b (3)—Phys. Lab.	2
Mil. 2c (2)—Mil. Drill	1	T. & A. M. 20 (7)—Analyt. Mech.	3
Total	18	Mil. 2d (2)—Mil. Drill	1
		Total	18

THIRD YEAR

Chemistry (1a or 1b)	4	C. E. 60 (12)—Bridge Anal.	2
C. E. 51 (4)—R. R. Surveying	5	C. E. 60 (20)—Graphic Statics	2
R. E. 25—R. R. Eng'g.	3	R. E. (31)—Ry. Yds. & Terminals	3
T. & A. M. 21 (8)—Analyt. Mech.	2½	R. E. 34—Ry. Maintenance	4
T. & A. M. 29 (9)—Res. of Mat'ls.	4½	T. & A. M. (10)—Hydraulics	3
Total	19	Non-technical Elective	3
		Total	17

FOURTH YEAR

C. E. (5)—Masonry Const.	5	C. E. 6b (6)—Masonry Design	2
C. E. (12)—Bridge Analysis	2	C. E. (14a)—Bridge Design	2
C. E. (18)—Tunneling	1	C. E. (16)—Eng. Con. & Spec.	2
C. E. 31 (24)—Metal Structures	1	Econ. (42)—Ry. Administration	3
Econ. (41)—Ry. Hist. & Org.	3	R. E. (30)—Thesis	3
R. E. (33)—Ry. Location	4	R. E. (32)—Ry. Construction	2
R. E. (35)—Ry. Signaling	1	R. E. 51 (50)—Seminar	1
R. E. (50)—Seminar	1	Total	15
Total	18	Total	15

¹For definition see page 76.²The numbers refer to courses in the Description of Courses, page 76. Numbers in parenthesis are old numbers.

Railway Electrical Engineering Course, as Taught 1914-15

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. (1) ² —Inorg. Chemistry.....	4	Chem. (2 and 3) ² —Inorg. Chem. & Analy. 4	
G. E. D. (1)—Gen. Eng. Dwg.....	4	G. E. D. (2)—Descrip. Geometry.....	4
Math. (2)—Adv. Algebra.....	3	Math. (6)—Analytic Geometry.....	5
Math. (4)—Trigonometry.....	3	Rhet. 2 (1)—Rhet. & Themes.....	3
Rhet. (1)—Rhet. & Themes.....	3	Mil. (1)—Drill Regulations.....	1
Mil. 2a (2)—Military Drill.....	1	Mil. 2b (2)—Military Drill.....	1
P. T. (1)—Gymnasium.....	1	P. T. 2 (1)—Gymnasium.....	1
Total.....	18	Total.....	19

SECOND YEAR

Math. (7)—Differential Calc.....	5	Chem. (1)—Inorganic Chemistry.....	4
M. E. (24)—Mach. Design & Mech.....	3	Math. (9)—Integral Calculus.....	3
M. E. 77 (42)—Shop Practice.....	2	Phys. 1b (1)—Phys. Lectures.....	2
Phys. 1a (1)—Physics Lectures.....	3	Phys. 3b (3)—Phys. Laboratory.....	2
Phys. 3a (3)—Physics Laboratory.....	2	Rhet. 2 (1)—Rhet. and Themes.....	3
Rhet. (1)—Rhet. and Themes.....	3	T. & A. M. 20 (7)—Analy. Mechanics.....	3
Mil. 2c (2)—Military Drill.....	1	Mil. 2d (2)—Military Drill.....	1
Total.....	19	Total.....	18

THIRD YEAR

Chem. (2 and 3)—Inorg. Chem & Anal... 4	E. E. (5)—Alternating Cur..... 4
E. E. 25 (3)—Dynamo Elec. Mach..... 4	E. E. (23)—Elec. Eng. Lab..... 2
E. E. (22)—Elec. Eng. Lab..... 2	M. E.—Steam Engines..... 3
Phys. 4a (4)—Elec. & Mag. Meas..... 2	Phys. 4b (4)—Elect. and Mag..... 2
R. E. (25)—Rwy. Engineering..... 3	R. E. (60)—Elec. Ry. Prin..... 2
T. & A. M. 25 (9)—Res. of Materials... 4	T. & A. M. 21 (8)—Analytical Mech... 3
Total..... 19	Non-technical elective..... 3
	Total..... 18

FOURTH YEAR

Econ. (2)—Prin. of Econ..... 2	Econ. (16)—Econ. Problems..... 2
E. E. (14)—Adv. Alt. Currents..... 4	E. E. 56 (34)—Elec. Design & Power
E. E. (24)—Elec. Eng. Lab..... 2	Plants..... 3
M. E. 11 (15)—Thermodynamics..... 3	R. E. 10 (10)—Seminar..... 1
M. E. (23)—Steam Engines..... 2	R. E. (30)—Thesis or Option..... 3
R. E. 9 (10)—Seminar..... 1	R. E. (63)—Elec. Ry. Lab..... 3
R. E. (64)—Elec. Ry. Practice..... 3	R. E. (65)—Elec. Ry. Practise..... 3
Total..... 17	Total..... 15

Railway Mechanical Engineering Course, as Taught 1914-15

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. (1b) or (1a) ² —Inorg. Chem.	4	Chem. (16) ² —Eng. Chem.	4
G. E. D. (1)—G. E. D.	4	G. E. D. (2)—Descr. Geom.	4
Math. (2)—Adv. Algebra	3	Math. (6)—Analyt. Geom.	5
Math. (4)—Trigonometry	2	Rhet. 2 (1)—Rhet. and Themes	3
Rhet. (1)—Rhet. and Themes	3	Mil. 2b (2)—Mil. Drill	1
Mil. 2a (2)—Mil. Drill	1	Mil. (1)—Drill Reg.	1
P. T. (1)—Gymnasium	1	P. T. 2 (1)—Gymnasium	1
Total	18	Total	19

¹For definition see page 76.

²The numbers refer to courses in the Description of Courses, page 76. Numbers in parenthesis are old numbers.

SECOND YEAR

Math. (7)—Diff. Calc.....	5	Math. (9)—Integral Calc.....	3
M. E. (4)—Mach. Design.....	2	M. E. 2 (16)—Steam Eng.....	3
M. E. 77 (42)—Mach. Shop.....	3	M. E. 79 (42)—Mach. Shop.....	2
Physics 1a (1)—Phys. Lect.....	3	Phys. 1b (1)—Phys. Lectures.....	2
Physics 3a (3)—Phys. Lab.....	2	Phys. 3b (3)—Phys. Lab.....	2
Rhet. (1)—Rhet. and Themes.....	3	Rhet. 2 (1)—Rhet. and Themes.....	3
Mil. 2c (2)—Mil. Drill.....	1	T. & A. M. 20 (7)—Analyt. Mech.....	3
—	—	Mil. 2d (2)—Mil. Drill.....	1
Total.....	19	Total.....	19

THIRD YEAR

Chem. (1a) or (1b)—Inorg. Chem.....	4	Chem. (16)—Eng. Chem.....	3
Elec.—Non-Tech.	3	Non-technical elective.....	3
Math. (9a)—Integral. Calc.....	2	M. E. 11 (15)—Thermodynamics.....	3
R. E. 25—Rwy. Eng.....	3	M. E. (23)—Steam Engines.....	2
T. & A. M. 21 (8)—Analyt. Mech.....	3	M. E. 61 (13)—Power Measur.....	3
T. & A. M. 29 (9)—Res. Mater.....	4	R. E. 6—Locomotives	4
—	—	—	—
Total.....	19	Total.....	18

FOURTH YEAR

Econ. (2)—Prin. of Econ.....	2	C. E. 96 (10)—Surveying.....	2
E. E. 12 (6)—Alt. Curr.....	2	Econ. (16)—Econ. Prob.....	2
M. E. (8)—Mech. Mater.	3	R. E. (3)—Shops and Aux. Equip.....	2
R. E. (1)—Locomotives	2	R. E. (7)—Adv. Design.....	3
R. E. (2)—Loco. Design.....	3	R. E. (10)—Seminar.....	1
R. E. (4)—Loco. Perf.....	2	R. E. (30)—Thesis.....	3
R. E. (8)—Dyn. Car. Test.....	2	R. E. (61)—Traction.....	3
R. E. (9)—Seminar	1	—	—
Total.....	17	Total.....	16

THE COLLEGE OF AGRICULTURE

Agricultural students should read the General Directions given in paragraphs 1-26 on pages 5-11. Further special directions will be furnished them with their study-lists.

REQUIREMENTS FOR GRADUATION

Students who have satisfied all matriculation requirements and have maintained throughout their course a satisfactory record of scholarship and moral character will be graduated with the degree of Bachelor of Science, upon having completed the studies of the prescribed list and sufficient electives to make a total of 130 semester hours.

A thesis is not required for graduation, but any student who has completed not less than 90 hours of credit before the senior year may then elect a thesis course in any department in which he has done not less than 20 hours' work, subject to the approval of the head of the department in question.

Graduates of approved colleges may expect to secure a degree in agriculture from the University of Illinois upon completion of the technical and scientific requirements. This will ordinarily require approximately two years of residence work; a minimum of one year will be exacted.

General Course in Agriculture

All students except those in the special courses in household science, floriculture, and landscape gardening are required to take the same work during the freshman year and part of the sophomore year. This work gives the student a correct conception of the fundamental farm practises and an insight into the technical branches of agriculture, such as animal and dairy husbandry, horticulture, farm crops, soils, farm mechanics, buildings, etc., and leaves the junior and senior years open for election.

One hundred thirty hours are required for graduation, as follows:

Agriculture prescribed first two years.....	19 hours
Agriculture prescribed as electives.....	40 hours
Total agriculture required.....	59 hours
Non-agriculture prescribed	42 hours
Non-agriculture prescribed as electives.....	15 hours
Total non-agriculture required.....	57 hours
Open electives	14 hours
	<hr/> 130 hours

PRESCRIBED SUBJECTS

Required for the Degree of Bachelor of Science in the General Course in Agriculture

FIRST YEAR

<i>First Semester</i>	Hours	<i>Second Semester</i>	Hours
Chemistry 1.....	5	Chemistry 2 and 3.....	5
Rhetoric 1*	3	Rhetoric 2	3
Agronomy 25	4	Animal Husbandry 5.....	3
Horticulture 1a.....	2	Dairy Husbandry 3.....	1
Agricultural Extension 4.....	1/2	Horticulture 1b	2
Military 2a	1	Agricultural Extension 5.....	7/2
Physical Training.....	1	Military 1 and 2b.....	2
		Physical Training	1

SECOND YEAR

Chemistry 13a or Botany 1.....	5	Botany 1 or Chemistry 13a.....	5
Animal Husbandry 6.....	3	Agronomy 26	3
Military 2c	1	Military 2d	1
Electives		Electives	

In addition to the above, students will take the following:

Agriculture, electives.....	40 hours
Non-agriculture, electives.....	15 hours
English 20	4 hours
Science, elective.....	5 hours
Open electives	14 hours

Students registered previous to September, 1912, will meet the requirements outlined below so far as it is possible to do so:

PRESCRIBED SUBJECTS

Required for the Degree of Bachelor of Science in the General Course in Agriculture

Agronomy 6 or 7, 9, 12.....	12 1/2 hours
Animal Husbandry 7.....	3 hours
Chemistry 1, 2, 3, 13a.....	15 hours
Dairy Husbandry 1.....	3 hours
Economics 2.....	2 hours
English 20	4 hours
Entomology 4a-4b	3 hours
Horticulture 1a-1b, 10a	8 hours
Military 1, 2a-2b, 2c-2d	5 hours
Physical Training 1-2, 1a	2 hours
Rhetoric 1-2	6 hours
Animal Husbandry 30 (Genetics).....	5 hours

Total prescribed subjects.....68 1/2 hours

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See page 9.

Elective List A; a minimum of.....	4	hours
Elective List B; a minimum of.....	3	hours
Elective List C; a minimum of.....	25	hours
Elective List D; a minimum of.....	10	hours

Total	42	hours
-------------	----	-------

ELECTIVE LISTS

List A—Animal Husbandry 1 to 4a-4b, 11a to 14, 17 to 18, 22
Dairy Husbandry 2

List B—English literature 2, 12-13, 23
Rhetoric 16, 20, 19, 3

List C—This list includes all subjects offered in technical agriculture and not included in the prescribed list, viz:

Agricultural Extension 1, 3
Agronomy 1 to 8, 10, 13, 16 to 22
Animal Husbandry 1 to 4a-4b, 8 to 14, 16, 18, 21 to 23
Dairy Husbandry 2, 7, 8, 11 to 22
Horticulture 2 to 9, 10b to 15b, 17 to 34
Veterinary Science 4, 5, 6

List D—Botany 1, Bacteriology 5, Zoology 1

Summary

Total prescribed subjects.....	68½	hours
Total list electives.....	42	hours
Total open electives.....	19½	hours

Total	130	hours
-------------	-----	-------

General Course in Floriculture

The object of this course is to fit men and women for the profession of floriculture. The laboratory exercises in the technical subjects consist of practical work in the greenhouses and garden and give the student a working knowledge of the best methods now in use.

FIRST YEAR

FIRST SEMESTER Prescribed Subjects

Entomology 4a.....	3
Chemistry 1.....	5
Horticulture 4.....	4
Rhetoric 1.....	3
Military	1
Physical Training.....	1
Total.....	17

SECOND SEMESTER Prescribed Subjects

Chemistry 2.....	2
Chemistry 3.....	3
Horticulture 5.....	5
Rhetoric 2.....	3
Military	2
Physical Training.....	1
Total.....	16

SECOND YEAR

Botany 1.....	5
English 20.....	4
Military	1
Total.....	10

Agronomy 9.....	5
Horticulture 15a.....	5
Military	1
Total.....	11

THIRD YEAR

Botany 7a.....	5	Botany 3b.....	5
Horticulture 15b.....	5	Horticulture 7.....	3
Economics 2.....	2	Horticulture 24a.....	3
	—		—
Total.....	12	Total.....	11

FOURTH YEAR

Horticulture 31.....	3	Horticulture 30.....	5
Horticulture 24b.....	3	Horticulture 10b.....	3
	—	Horticulture 32.....	4
	—		—
Total.....	6	Total.....	12

Suggested Electives

Accountancy	Chemistry 13a
Agronomy 12	Economics
Animal Husbandry 30	Horticulture 28
Botany 3a, 4a, 7b	

General Course in Landscape Gardening

A four years' course in preparation for professional practise, is open to any student in the University having the prerequisites or their equivalents.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Math. 4—Trigonometry.....	2
Rhet. 1—Rhetoric and Themes.....	3
Arch. 31—Drawing.....	4
Botany 1—Introduct. Course.....	5
Mil. and P. T.....	2
	—
Total.....	16

SECOND SEMESTER

Prescribed Subjects

Entomology 4b—Intr. to Econ. Ent.....	3
Rhet. 2—Rhetoric and Themes.....	3
Arch. 32—Arch. Drawing.....	4
Hort. 5—Plant Propagation.....	5
Mil. and P. T.....	3
	—
Total.....	18

SECOND YEAR

Prescribed Subjects

Hort. 10a—Landscape Gardening.....	3
Hort. 21a—Landscape Design.....	4
Botany 4d—Taxonomy.....	3
Hort. 31—Garden Flowers.....	3
Military	1
C. E. 27—Surveying.....	3
	—
Total.....	17

Prescribed Subjects

Hort. 21b—Landscape Design.....	4
Hort. 24a—Trees and Shrubs.....	3
C. E. 28—Surveying.....	3
Military	1
	—
Total.....	11

Electives, Second Semester

<i>Plants—</i>	
Hort. 2—Small Fruits.....	2
<i>Design—</i>	
Art and Des. 12—Theory and Prac.....	5
Geology 12.....	5

THIRD YEAR

Prescribed Subjects

Hort. 23a—Landscape Design.....	4
Hort. 24b—Trees and Shrubs.....	3
Hort. 27a—Landscape Practise.....	3
Arch. 6a—History of Arch.....	4
	—
Total.....	14

Prescribed Subjects

Hort. 23b—Landscape Design.....	4
Hort. 26a—Planting Design.....	3
Hort. 27b—Landscape Practise.....	3
Arch. 6b—History of Arch.....	4
Hort. 36—Landscape Reading.....	2
	—
Total.....	16

Electives

<i>Plants—</i>	
Hort. 8—Fruit Culture.....	5
<i>Design—</i>	
Hort. 29a—Garden Design.....	3
Art and Design 13—Hist. and Pract.....	2
<i>Civic Design—</i>	
Economics 2—Prin. of Econ.....	2
Sociology 1—Prin. of Soc.....	3

Electives

<i>Plants—</i>	
Hort. 7—Spraying.....	3
Hort. 9—Forestry.....	2
<i>Design—</i>	
Hort. 29b—Garden Design.....	3
Art and Design 8—Modeling.....	2
<i>Civic Design—</i>	
Rhetoric 17—Adv. Comp.....	3
Sociology 7—The Rural Community.....	2

FOURTH YEAR

Prescribed Subjects

Hort. 25a—Landscape Design.....	5
Hort. 26b—Planting Design.....	3
Hort. 37a—Civic Design.....	2
—	
Total.....	10

Prescribed Subjects

Hort. 25b—Landscape Design.....	5
Hort. 28—Exotics.....	1
C. E. 52—Roads and Pavements.....	2
Hort. 38—Field Practise.....	2
Hort. 37b—Civic Design.....	3
—	
Total.....	13

Electives

<i>Plants—</i>	
Hort. 40a.....	3
<i>Design—</i>	
Hort. 25a (Extra hours)	
Art and Design 4—Water color.....	2
<i>Civic Design—</i>	
Sociology 10—Population.....	3
Pol. Sci. 4—Mun. Government.....	3

Electives

<i>Plants—</i>	
Hort. 15a—Plant Growing.....	5
Hort. 40b—Trees and Shrubs	
<i>Design—</i>	
Hort. 25b (Extra hours)	

General Electives

Modern language.....	8 hours	Horticulture 19.....	3 hours
Zoology 1.....	5 hours	Horticulture 39.....	1-8 hours

Requirements for Graduation

The following are the requirements for the degree of Bachelor of Science in Landscape Gardening.

1. The student must complete the work outlined in the course as prescribed subjects.
2. There must be obtained from the elective subjects enough additional credits to complete the graduation requirement of 130 hours.

General Course for Prospective Teachers of Agriculture

A general course is offered for prospective teachers of agriculture. Among the subjects recommended are the following:

Agronomy 2, 9, 12, 25, 26; Animal Husbandry 1a, 2a, 4a, 5, 6, 11a, 11b, 30*; Dairy Husbandry 2, 3; Horticulture 1a, 1b, 3, 5, 10a, 19; Agricultural Extension 1, 4-5; Botany 1, 12; Chemistry 1, 2, 3, 13a; Entomology 4a-4b; Zoology 1; English 20; Rhetoric 1-2, 19; Public Speaking 5-6, 7-8; Economics 2; Education 1, 6; Library Science 12; Military 1, 2a-2b, 2c-2d; Physical Training 1-2, 1a; foreign language.

*Students taking the Teachers' course may take Animal Husbandry 30 for one-half semester and receive 2½ credits therefor.

General Course in Household Science

Of the 130 hours required for graduation, 91 are provided for in the prescribed list and the restricted electives of List A. The other 39 hours of credit necessary for graduation may be taken, subject to the approval of the Dean of the College, from any courses offered in the University. Holders of scholarships in household science in this College take the course as laid out here. Variations from it can be made only by special permission of the Council of Administration on recommendation of the faculty of the College.

PRESCRIBED SUBJECTS

Required for the Degree of Bachelor of Science in General Course in Household Science

Art and Design 1, 12, 19, 20.....	9 hours
Botany 1, 5.....	10 hours
Chemistry 1, 2, 3.....	10 hours
English 1-2	8 hours
Household Science 1, 2, 3, 6, 7a-7b, 10, 12, 14a-14b.....	20 hours
History 1a-1b, or 3a-3b	6 or 8 hours
Physiology 4a-4b	5 hours
Physical Training 7a-7b, 9	3 hours
Rhetoric 1-2	6 hours
Zoology	5 hours
English or Rhetoric	5 hours
*List A, a minimum of.....	4 hours

Total required subjects	91 to 93 hours
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Electives	39 to 37 hours
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<i>Total</i>	130 hours
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ELECTIVES

List A.—English 19, 24
 Horticulture 1a, 1b, 2, 3, 5, 19, 28
 Household Science 5a-5b, 13
 Economics 2, Sociology 1
 Physics 7a-7b
 Education 1, 2, 6, 9
 Agronomy 2, 5, 7
 Animal Husbandry 10, 2a, 2b
 Dairy Husbandry 1, 3, 14, 19

Course of Instruction

First Year

1. Household Science 2; Chemistry 1; Rhetoric 1; Physical Training 7a and 9; Art and Design 1.

2. Household Science 1, 7; Chemistry 2, 3; Rhetoric 2; Physical Training 7.

*If physics has not been offered for entrance, its equivalent should be elected.

Second Year

1. Household Science 6; Zoology 1; English 1; Horticulture 19; electives.
2. Household Science 14a-14b; Botany 1; Art and Design 12; Horticulture 19; English 2; electives.

Third Year

1. Art and Design 19; Physiology 4a; advanced English; electives.
2. Household Science 3, 12; advanced English; Economics 2; Art and Design 20; electives.

Fourth Year

1. Sociology 1; Education 1; History 3a.
2. Education 2 or 6; Bacteriology 5; History 3b; Household Science 10.

THE SCHOOL OF MUSIC

Music students should read the General Directions given in paragraphs 1-26 on pages 5-11. Having secured their study-lists (see paragraphs 1-6, page 5-6), they should report to their advisers in Room 202, University Hall.

Each student should follow, *point by point*, the directions given on the first coupon of his or her study-list.

Required courses in the College of Liberal Arts and Science must be approved by the Registrar's representative in Room 202.

Practise pianos in the Woman's Building may be secured at the rate of \$3 per semester for one hour a day.

Choral, orchestral, or ensemble work is required of all students who are sufficiently advanced.

All music students are required to attend the concerts and recitals which are given under the auspices of the School of Music.

Public performance being part of the course of study in a practical subject, all students are required to participate in a program when sufficiently prepared.

Students who, by reason of deficient musical ability, inattention, or other valid reason, fail to make satisfactory progress, may be dropped from the classes.

The courses of study in piano, voice, and stringed instruments are planned with the idea that four hours' preparation a day will be spent upon the lessons, to complete the courses in the specified time.

REQUIREMENTS FOR GRADUATION

Candidates for the degree of Bachelor of Music must offer credit for 130 semester hours, including the prescribed subjects named below, together with an acceptable thesis on a topic related to music.

FIRST SEMESTER		FIRST YEAR		SECOND SEMESTER	
	S. H.		S. H.		S. H.
Music 3, Harmony.....	2	Music 4, Harmony.....	2	Music 42b, 52b or 62b, Piano, Voice, or	2
Music 42a, 52a or 62a, Piano, Voice, or		Music 42b, 52b or 62b, Piano, Voice, or		Violin.....	6
Violin.....	6	Music 21b, Ear Training.....		Rhet. 2, Rhetoric and Themes.....	3
Music 21a, Ear Training.....		Rhet. 2, Rhetoric and Themes.....	3	Foreign language, French, German, or	
*Rhet. 1, Rhetoric and Themes.....	3	Foreign language, French, German, or		Italian.....	4
Foreign language, French, German, or		Italian.....	4	Phys. Tr. 7a, Gymnasium (women).....	1
Italian.....	4	Phys. Tr. 7b, Gymnasium (women).....	1	Phys. Tr. 9, Hygiene (women).....	1
Phys. Tr. 7a, Gymnasium (women).....	1	Phys. Tr. 2, Gymnasium (men).....	1	Phys. Tr. 1, Gymnasium (men).....	1
Phys. Tr. 9, Hygiene (women).....	1	Mil. 2b, Drill (men).....	1	Phys. Tr. 1a, Hygiene (men).....	1
Phys. Tr. 1, Gymnasium (men).....	1	Mil. 1, Drill Regulations (men).....	1	Mil. 2a, Drill (men).....	1
Phys. Tr. 1a, Hygiene (men).....	1				
Mil. 2a, Drill (men).....	1				
Total, Men.....	17	Total, Men.....	18		
Total, Women.....	17	Total, Women.....	16		

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See page 9.

SECOND YEAR

Music 1, History of Music.....	2	Music 2, History of Music.....	2
Music 5, Advanced Harmony.....	3	Music 6, Advanced Harmony.....	3
Music 43a, 53a, or 63a, Piano, Voice, or Violin	6	Music 43b, 53b, or 63b, Piano, Voice, or Violin	6
Music 22a, Ear Training.....	1	Music 22b, Ear Training.....	1
Music 23a, Sight Singing.....	1	Music 23b, Sight Singing.....	1
Foreign language, French, German or Italian	4	Foreign language, French, German or Italian	4
Mil. 2c, Drill (men).....	1	Mil. 2d, Drill (men).....	1
<i>Total, Men</i>	<u>17</u>	<i>Total, Men</i>	<u>17</u>
<i>Total, Women</i>	<u>16</u>	<i>Total, Women</i>	<u>16</u>

THIRD YEAR

Music 7, Counterpoint, Canon and Fugue. 3	Music 8, Counterpoint, Canon and Fugue. 3
Music 44a, 54a, or 64a, Piano, Voice, or Violin	Music 44b, 54b, or 64b, Piano, Voice, or Violin
Music 24a, Sight Singing.....	Music 24b, Sight Singing.....
Education 1, Principles.....	Music 12, Acoustics.....
English 1, Survey of English Literature.. 4	English 2, Survey of English Literature.. 4
<i>Total</i>	<i>Total</i>
<u>17</u>	<u>15</u>

FOURTH YEAR

Music 9, General Theory, Free Composition 2	Music 10, General Theory, Free Composition 2
Music 11, Acoustics.....	Music 45b, 55b, or 65b, Piano, Voice, or Violin
Music 45a, 55a, or 65a, Piano, Voice, or Violin	Music 46b, 56b, or 66b, Minor Subject.... 2
Music 46a, 56a, or 66a, Minor Subject.... 2	Music 94b, Recital.....
Music 94a, Recital.....	
English 4, English Versification.....	
<i>Total</i>	<i>Total</i>
<u>17</u>	<u>13</u>

In addition, for Women: 4 hours elective, to make up the prescribed total of 130 hours. These four extra credits may be taken at any time; the election made must be approved by the student's adviser.

Courses 42a-42b to 65a-65b, include regular attendance in Music 91a-91b (Orchestra), Music 93a-93b (Choral Society), and Music 94a-94b (Ensemble Class), unless a student is excused by the Director of the School of Music.

*COURSE IN PUBLIC SCHOOL MUSIC

The aim of the Course in Public School Music is to prepare competent teachers and supervisors of music for the public schools. Students completing the course are granted teachers' certificates. An opportunity for practise teaching is offered. The course is one year in length, and comprises the following prescribed subjects:

Music 1-2—History of Music.....	4 hours
Music 3-4—Harmony.....	4 hours
Music 21a-21b—Ear Training.....	2 hours
Music 23a-23b—Sight Singing.....	2 hours
Music 25a-25b—Methods of Teaching.....	8 hours
Practical Music, major, Piano or Voice (42a-42b or 52a-52b).....	12 hours
Practical Music, minor, Voice or Piano (56a-56b or 46a-46b).....	4 hours
<i>Total</i>	<u>36 hours</u>

Advanced students may satisfy a part of the foregoing requirements by examination; in no case, however, is a student permitted to take less than 30 hours of work.

*A Teacher's Certificate is granted to students who show ability to teach, upon creditable completion of the course in Public School Music.

THE SCHOOL OF EDUCATION

COURSE

The course of study of the School of Education is made up of offerings selected from the work of the various departments of instruction in the University. The course is elective except for the graduation requirements of the college in which the student is registered. Certain subjects are, however, required of all students who wish to be officially recommended by the University for high school positions. The work is arranged in four groups:

(a) Courses in education, psychology, and sociology bearing directly upon the profession of the teacher.

(b) Courses especially intended for teachers, offered by various departments of the University.

(c) Suggested programs for students preparing to become special teachers and supervisors of agriculture, domestic science, drawing, music, or physical training.

(d) Suggested programs for continuous and progressive work in subjects represented in the high school curriculum.

COMMITTEE ON APPOINTMENT OF TEACHERS

This committee has in charge the naming of candidates from among graduates of the University for positions as teachers or supervisors in public schools, colleges, and technical schools.

The Director of the School of Education is chairman of this committee, and the official nominations of students and graduates of the University to public school positions are made through his office.

The following resolution was adopted by the University Senate, June 3, 1912:

1. The University Committee on Appointments is authorized to issue its recommendation, signed by the committee as the agent of the University in all cases in which it is satisfied with the student's scholarship and ability to teach. The committee shall regard the scholarship requirements as met if, in addition to carrying the professional courses mentioned in the next paragraph, the student has passed with an average grade of 85 in the courses necessary to constitute a major in the principal subject which he wishes to teach, and in courses aggregating a minimum varying from six to twelve semester hours (according to subject, and at the discretion of the committee) in each of the other subjects for which he wishes to be recommended. The committee shall, however, in each case secure the written opinion of the departments concerned, of the scholarship of the applicant, and shall view the evidence of scholarship as shown by the records in the light of this opinion; and if there appear to the committee to be reasons which, from their nature, can not be shown by mere records, for questioning the scholastic ability of the student, the committee may, in its discretion, withhold the recommendation.

2. A candidate must have successfully completed the following courses in the department of education:

a. An introductory course which shall aim (1) to acquaint the prospective teacher with the public-school system as it exists today in the United States, and (2) to present a brief outline of the principles of education. (A three-hour course.)

b. A course in the technique of teaching, accompanied by observation of class-room work in secondary schools, and including a discussion of class-management (routine and discipline), the elements of school hygiene, and the types of school exercises. (A three-hour course.)

3. The Director of the School of Education may, in his discretion, excuse a candidate from the professional courses outlined above (1) if the candidate is a normal school graduate or has taken equivalent courses in a normal school or in another college or university; or (2) if the candidate has had at least one year of successful teaching experience. If, at the time of registration with the Committee on Appointments, the candidate has not completed one of the required courses but is enrolled at that time in the course, a committee recommendation may be given with the approval of the instructor in charge of the course.

The courses mentioned in Section 2 of the above resolutions are (a) Education 1, Introduction to Education, which is now offered as a three-hour course during either the first or the second semester; and (b) Education 10, Observation and Technique of Teaching, a three-hour course. Education 10 may be taken either the first or the second semester.

THE SCHOOL OF RAILWAY ENGINEERING AND ADMINISTRATION

GENERAL STATEMENT

The School of Railway Engineering and Administration has been established to prepare men broadly for the technical and administrative departments of railroads. The work offered is arranged in five different courses, any one of which is designed to occupy four years' time. The courses are:

- Railway Civil Engineering
- Railway Mechanical Engineering
- Railway Electrical Engineering
- Railway Transportation
- Railway Traffic and Accounting

The first three of these courses are administered by the College of Engineering, and a description of them appears with that of other courses offered by this College. Students are admitted to them under the same conditions as to other courses of the College of Engineering, and they have available for their use all of the library, drafting-room, and laboratory facilities which constitute the equipment of this College. The last two courses are administered by the College of Liberal Arts and Sciences; they are described in detail in connection with the other courses of this College. Students are admitted to them under the same conditions as to other courses of the College of Liberal Arts and Sciences.

It is the purpose of each of these courses to add to the broad foundation of discipline and training which should be supplied by every college course such specialized training as will be most useful to those who look forward to careers in railway service.

THE COLLEGE OF LAW

Law students should read the General Directions given in paragraphs 1-26 on pages 5-11. Having secured their study-lists (see paragraphs 1-6, pages 5-6), they should report to their advisers in Room 206, Law Building.

Each student should follow, *point by point*, the directions given on the first coupon of his study-list.

REQUIREMENTS FOR GRADUATION AND DEGREES

The degree of Bachelor of Laws will be granted to all regularly matriculated students who complete all the courses in the first year list; courses 8, 10, 11, 12, 18, 20, 35 (second year); courses 4a, 15, 17, 19, 21, 22, 36, 31 (third year); and enough of the other courses offered to make 84 hours of credit.

DEGREE OF DOCTOR OF LAW

The degree of Doctor of Law (J. D.) will be granted to students who comply with the following conditions:

1. Complete the work required for the degree of Bachelor of Laws.
2. Secure a bachelor's degree in arts or science at least two academic years prior to the completion of the course for the degree of Bachelor of Laws.
3. Obtain a minimum average grade of 85 in the College of Law.
4. Present a thesis approved by the faculty of the College of Law, in accordance with the requirement hereinafter set out.

Students who receive the A.B. degree after registering in the College of Law, and, by counting courses in law toward both the degree of A.B. and the degree of LL.B., take both degrees in six years, must during the first year in the College of Law take four hours in history or the social sciences.

Rules concerning Theses

The following are the rules concerning theses presented for the degree of Doctor of Law: 1. The thesis must be on a subject approved by the Dean of the College of Law after consultation with him as to the proposed method of treatment. 2. The subject of the thesis must be filed with the Secretary on or before December 20. 3. The thesis must be typewritten on paper 8½x11 inches, with at least one inch margin at the top, bottom, and sides. 4. It should contain not less than 4,000 nor more than 10,000 words. 5. In citing cases, names of parties, volume, page, and year should be given. Citations are not to be counted in determining the number of words. The student is expected to exhaust the cases decided during the period covered by his thesis, and to state the period for which the cases have been examined. 6. The thesis must be delivered to the Secretary of the faculty not later than May 1.

The thesis may then be returned to the writer for revision, or if unsatisfactory, it may be rejected altogether. If returned for revision it may be rejected after being revised. If accepted, it will be filed in the Law Library, and may be published by the College of Law or by the University.

CERTIFICATE FOR ADMISSION TO THE ILLINOIS STATE BAR EXAMINATION

Any student, altho not a candidate for a law degree, if he has taken the following courses: 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 18, 20, 35, 36, 4a, 15, 17, 19, 21, 22, and 31, is entitled to a certificate thereof from the University, which certificate satisfies the requirements as to legal studies prescribed by the Supreme Court of the State of Illinois for admission to the bar.

COURSE LEADING TO THE DEGREE OF LL.B

FIRST YEAR

FIRST SEMESTER: Contracts (Law 1a); Torts (Law 2a); Criminal Law (Law 5); Personal Property (Law 6).

SECOND SEMESTER: Contracts (Law 1b); Torts (Law 2b); Real Property (Law 3); Common Law Pleading (Law 4); Domestic Relations (Law 7).

SECOND YEAR

FIRST SEMESTER: Evidence (Law 8); Agency (Law 11); Equity (Law 12a); Moot Court (Law 35a); Public International Law (Law 30); Insurance (Law 28).

SECOND SEMESTER: Real Property (Law 10b); Damages (Law 13); Wills (Law 18); Equity Pleading (Law 20); Moot Court Law (Law 36b); Sales (Law 9); Carriers (Law 14); Future Interests in Property (Law 27); Conveyancing (Law 29); Quasi-Contracts (Law 32); Public Utilities (Law 34).

THIRD YEAR

FIRST SEMESTER: Illinois Procedure (Law 4a); Bills and Notes (Law 15); Private Corporations (Law 17); Constitutional Law (Law 22); Moot Court (Law 36a); Mortgages (Law 23); Bankruptcy (Law 25).

SECOND SEMESTER: Trusts (Law 16); Private Corporations (Law 17b); Partnership (Law 19); Suretyship (Law 21); Municipal Corporations (Law 24); Constitutional Law (Law 33); Moot Court (Law 36b); Conflict of Laws (Law 31).

SUGGESTED PREPARATORY COURSES

Below is given a schedule of studies recommended by the faculty of the College of Law for students taking one year in the College of Liberal Arts and Sciences to meet the present (1914-15) requirement for admission to the College of Law.

A schedule of studies covering two years is added for the guidance of those who take two years of pre-legal work, as required for admission in 1915-16 and thereafter.

One Year Course in Preparation for Law

FIRST SEMESTER	Hours	SECOND SEMESTER	Hours
Military 2a.....	1	Military 1 and 2b.....	2
Phys. Training 1 and 1a.....	1	Physical Training 2.....	1
Rhetoric 1.....	3	Rhetoric 2.....	3
Foreign Language.....	4	Foreign Language.....	4
History 1a.....	4	History 2b.....	3
Economics 7.....	3	Mathematics 2.....	3
<i>Total</i>	16	<i>Total</i>	16

The courses in Military and Physical Training, Rhetoric 1-2, and eight hours in foreign languages are required of freshmen in the College of Liberal Arts and Sciences. Latin is strongly urged for all students intending to study law; but those who have not had the necessary preparation for college courses in Latin should substitute a modern language, preferably French or German. Tho credit is usually not given for a single semester's work in History 1a-1b, arrangements have been made with the department of history by which a student taking only one year of work in preparation for law will receive credit for History 1a, provided that in the second semester he also receives credit in History 2b.

Two Year Course in Preparation for Law

Students who give two years to preparatory work are recommended to take the schedule given below:

FIRST SEMESTER		FIRST YEAR		SECOND SEMESTER	
	Hours		Hours		Hours
Military 2a.....	1	Military 1 and 2b.....	2		
Phys. Training 1 and 1a.....	1	Physical Training 2.....	1		
Rhetoric 1.....	3	Rhetoric 2.....	3		
Foreign Language	4	Foreign language.....	4		
Economics 7.....	3	History 2b.....	3		
Science	5	Mathematics 2.....	3		
Total	17	Total	16		
SECOND YEAR					
Military 2c.....	1	Military 2d.....	1		
Science or foreign language.....	5 or 4	English 20.....	4		
Political Science 1.....	3	Political Science 3.....	3		
Economics 1.....	5	Economics 3.....	3		
History 3a.....	3	Philosophy 1.....	3		
		History 3b.....	3		
Total	16 or 17	Total	17		

SCHOLARSHIP PRIZES

Eight scholarship prizes are open to matriculated students of the first and second years, to be awarded at the end of each year, four of \$50 each and four of \$25 each, available in discharge of tuition fees.

The American Law Book Company of New York offers an annual prize consisting of the Students' Edition of CYC, to be awarded to the member of the senior class making the best average during his senior year.

Callaghan & Company, law publishers, of Chicago, offer an annual prize consisting of the Cyclopedic Law Dictionary to be awarded to the member of the second-year class making the best average during his second year.

THE LIBRARY SCHOOL

Library students should present themselves in Room 320, Library Building, where both their admission and their registration may be completed.

SCHEDULE OF COURSE

The course is two years in length. For graduation a student must receive credit for all courses except those marked with an asterisk (*), which are elective. The degree of Bachelor of Library Science is conferred on a student who has completed the required work in the two years' course, and has received credit in courses amounting to 65 hours.

JUNIOR YEAR

FIRST SEMESTER

- 2a¹ Reference work (3 hrs.)
- 3a Selection of books (2 hrs.)
- 4a Practise work, 4 hours per week (2 hrs.)
- 16 Order, accession and shelf work (2 hrs.)
- 17 Classification and book numbers (3 hrs.)
- 18 Cataloging (3 hrs.)
- 23a Library administration and current library literature (1 hr.)

SECOND SEMESTER

- 2b¹ Reference work (3 hrs.)
- 3b Selection of books (2 hrs.)
- 4b Practise work, 4 hours per week (2 hrs.)
- 7 History of libraries (2 hrs.)
- 19 Trade bibliography (1 hr.)
- 20 Loan department (1 hr.)
- 21 Printing, binding, indexing (2 hrs.)
- 22 Library extension (3 hrs.)
- 23b Library administration and current library literature (1 hr.)

SENIOR YEAR

- 6a Subject bibliography (2 hrs.)
- 8 *Advanced reference work (2 hrs.)
- 10a Practise work, 8 hours per week (4 hrs.)
- 13a Public documents (2 hrs.)
- 15a Seminar (2 hrs.)
- 24a Selection of books (2 hrs.)
- 26a Library administration (3 hrs.)
- 27 Bibliographical institutions (1 hr.)

- 6b Subject bibliography (2 hrs.)
- 9 Bookmaking (2 hrs.)
- 10b Practise work, 8 hours per week (4 hrs.)
- 13b *Public documents (2 hrs.)
- 15b Seminar (2 hrs.)
- 24b Selection of books (2 hrs.)
- 25 Advanced classification and cataloging (1 hr.)
- 26b Library administration (3 hrs.)
- 28 *Practise work in various departments of the library (1 to 4 hrs.)

PROPOSED PRELIMINARY COURSE

Undergraduates who intend, on the completion of their college work, to apply for admission to the Library School, are requested to select their courses so as to conform in general to the following recommended program of studies preparatory to library work:

Proposed Preliminary Course

English literature, 5²; rhetoric, 2.

Latin, 4, in addition to four years of high school Latin.

German, 6, in addition to two years of high school German.

¹The numbers in these columns refer to the Courses in Library Science in the General Description of Courses.

²The figures after each subject indicate the minimum number of lecture or recitation hours a week which the student should devote to that subject throughout one college year.

French, 4, in addition to two years of high school French.

Languages begun in college instead of in the high school should be continued for a longer period.

Medieval and modern European history, 3; history of England, 3; history of the United States, 3.

Economics, 3; political science, 2; sociology, 3.

Philosophy, 2; general psychology, 2.

Zoology, 3; botany, 2; chemistry or physics, 3.

The total of this work is 100 semester hours, leaving the equivalent of one year of a four-year course free for work in other subjects or for more work in the subjects named.

THE GRADUATE SCHOOL

Graduate students should present themselves at the office of the Dean of the Graduate School, Room 109, Commerce Building, where both their admission and their registration may be completed.

ADMISSION

For admission to the Graduate School to work for a degree an applicant must hold a first degree either from the University of Illinois or from some other university or college of equivalent standing. Admission to particular graduate courses or departments may be secured only by those who have had the requisite undergraduate work in those courses or departments.

In order to be enrolled as a member of the Graduate School a student must be doing graduate work. The possession of a first degree does not entitle a student to be enrolled in the Graduate School, if the courses which he is taking are undergraduate.

Students of mature age who do not hold a first degree, but satisfy the Dean of the School and the officers of the departments in which they wish to work of their earnestness of purpose and special fitness, may be permitted to take work in the Graduate School without reference to candidacy for a degree. In order to secure this permission, however, a candidate must have had such preliminary preparation for the work he wishes to take up as would justify his admission to the Graduate School as a candidate for a degree if he could meet the other requirements fully.

Each student is required to attend a minimum of four class, lecture, or laboratory exercises a week in the first year of his graduate study; in no case is he permitted during his course to attend more than twelve exercises a week.

Continuous residence and study are required of all members of the Graduate School, unless they are granted leave of absence by the Dean, upon recommendation of the professors in charge of their work, for the purpose of carrying on elsewhere studies or investigation in the line of work for their degrees.

The principal aim of graduate study is the development of the power of independent work and the promotion of the spirit of research. Each candidate for a degree is expected to have a wide knowledge of his subject and of related fields of work; for the graduate student is not expected to get from lecture and laboratory courses all the knowledge and training necessary to meet the requirements for his degree.

Students are warned against restricting themselves merely to the courses prescribed or suggested by the departments in which they are studying. Each student is expected to do a wide range of private reading and study; and in many cases will find it advisable to take one or more courses of lectures quite outside the field of his chosen subject.

Application blanks for admission may be secured from the Dean of the Graduate School or from the Registrar of the University.

THE MASTER'S DEGREE

Candidates for the degree of Master of Arts or Master of Science are required to do at least one year's work in residence and to write a thesis.

A candidate for a master's degree may do all his work in one subject, or he may select a major and one minor, or a major and two minors. A major or minor denotes the field of knowledge of a department, or such part thereof as constitutes a separate and independent division of that field. The candidate must do at least half his work in his major subject.

Each candidate for a master's degree is also required to present a thesis on some subject approved by the professor in charge of his major work and the faculty of the School. The requirement of a thesis may be waived, however, upon the recommendation of the head of the department in which the student is doing his major work and the approval of the Dean, provided application to waive the thesis is made at the beginning of the year. *In no case will permission to take the degree without a thesis be given if applied for later than the latest date for the approval of thesis subjects, as shown by the calendar.*

The thesis required from a candidate for a master's degree ordinarily will demand about one-fourth of the student's time. The thesis must be type-written, on "thesis paper," and the title-page must be printed. The thesis, in its final form, together with a certificate of approval by the proper officer, must be left by the student at the Dean's office at the time set in the calendar.

Credit is not given for work done in other universities. The candidate is examined here on the subjects offered by him for the advanced degree.

THE MASTER'S DEGREE IN ENGINEERING

Two classes of second degrees are open to graduates of the College of Engineering, namely, academic and professional.

The *academic* second degree in engineering is Master of Science, following Bachelor of Science, in Architecture, Architectural Engineering, Civil Engineering, Electrical Engineering, etc. This degree is conferred in accordance with the regulations described above *for academic work in residence only*.

The *professional* second degrees in engineering are as follows:

Master of Architecture after B. S. in Architecture.

Architectural Engineer after B. S. in Architectural Engineering.

Civil Engineer after B. S. in Civil Engineering or B. S. in Municipal and Sanitary Engineering.

Electrical Engineer after B. S. in Electrical Engineering.

Mechanical Engineer after B. S. in Mechanical Engineering.

Civil Engineer, Electrical Engineer, or Mechanical Engineer, after B. S. in Railway Engineering, according to the course.

Professional degrees are conferred upon two classes of candidates: 1. Graduates of the College of Engineering of the University of Illinois who have been engaged in acceptable professional work away from the University for a period of not less than three years after receiving the degree of Bachelor of Science. 2. Graduates of the University of Illinois, or of institutions of equal standing, who have been engaged in acceptable professional work in residence at the University for a period of not less than three years after receiving the degree of Bachelor of Science.

In "acceptable professional work" may be included contributions to technical literature, activity in professional societies, investigations of engineering problems, and the teaching of engineering subjects.

A candidate must declare his candidacy and file with the Dean of the College of Engineering, as chairman of the committee in charge, a detailed statement covering his professional study and experience, not later than the first Monday in November preceding the commencement at which he proposes to qualify. Prior to December 31 next succeeding, he must submit for approval an outline of his proposed thesis and he must file his completed thesis not later than April 1. If the statement of professional experience and study and the thesis are accepted, the candidate must present himself at commencement in order to receive the degree.

Candidates for professional degrees in engineering who already hold the degree of Master of Science may qualify for the professional degree after two years of professional work.

A candidate for a professional degree in engineering must pay the incidental fee of twenty-four dollars on being notified that his professional study and experience are accepted as qualifying him to enter as a candidate for the degree.

THE DEGREE OF DOCTOR OF PHILOSOPHY

General Statement of Requirements.—The requirements for the degree of Doctor of Philosophy are a thoro mastery of a selected field of study, evidence of the power of independent investigation in this field, a broad knowledge of the wider field of study of which this major subject is a part, a general acquaintance with related fields of knowledge, and a mastery of all branches of study which are necessary to a full knowledge of the main subject. Each student who is seeking this degree is expected to choose for study and final examination a major subject, or field of study, and a first and second minor. The major subject is the field in which the student expects to become expert and an authority. The first minor must be a subject closely related to the major and may, under certain conditions and with proper approval, be a subdivision of the major field of study. The second minor should be chosen outside of the major field of study.

When a candidate chooses any subject as his major, and a division of that subject as his minor, he is not permitted to choose as a second minor any division of work in that same department, excepting by vote of the executive faculty of the School.

The candidate's list of subjects must receive the approval of the head of the department in which he chooses his major work and of the Dean of the School.

Period of Study.—The minimum period of study required for securing the degree of Doctor of Philosophy is three years. The degree is conferred, however, not for residence during a certain period, but for scholarly attainments and power of investigation, as proved by thesis and examinations.

Candidates should note that credit is not given for work done in other universities, excepting in the sense that their residence at other institutions is counted towards the residence requirement for the doctor's degree.

At least the first two or the last one of the three years required must be spent at this University.

Examinations.—Towards the end of his second year of study, or, by special permission, at the beginning of his third year, the candidate for the degree must submit to a preliminary examination conducted by the members of the faculty with whom he is doing his principal work, in order to determine whether he will be accepted as a candidate for the degree in the following year. This examination is partly oral, and may be wholly so. At this time, or before, the candidate will be required to demonstrate his ability to read French and German, and any other language needed for the prosecution of his work.

On or before the last Monday in May of the year in which the candidate expects to come up for his degree, he must submit to a final examination by a committee appointed by the Dean of the Graduate School. This examination will be partly written. The candidate will also have, however, an oral examination. These examinations will not be confined to the courses which the candidate has attended in the University of Illinois only, if he has done part of the work elsewhere; nor even to the field covered by the courses specifically taken in this or other universities; but will be so conducted as to determine whether the candidate has a satisfactory grasp of his major subject as a whole, and a general acquaintance with the broad fields of knowledge represented by his course of study.

Before the candidate is admitted to the final examination and the defense of his thesis, he may be required to take any other examination, oral or written, that is thought proper by the various departments in which he has studied. If, after having passed his preliminary examination, he fails in the third year of his study to meet the expectations of the professors in charge of his work, or in any way fails to maintain the standard of scholarship and power of research expected of him, he may be refused admission to the final examination.

The final examination in the major and minor subjects may not be divided. The examination must be taken all at one time even though it requires several sessions.

Thesis.—The power of independent research must be shown by the production of a thesis on some topic connected with the major subject of study. The candidate is expected to defend his thesis or dissertation before the members of the faculty, or as many of them as may wish to question him about it, in connection with his final examination.

The subject of the thesis should be chosen not later than the end of the second year of study, and must be submitted for formal approval by the faculty not later than the first Monday of November of the year when the degree is expected. A typewritten copy of the complete thesis, on thesis paper, with proper certificate of approval, must be in the hands of the Dean not later than noon of the Saturday nearest the middle of May.

The thesis must be printed and one hundred copies deposited in the library of the University before the degree is conferred. If, for any reason, the thesis cannot be printed and one hundred copies deposited before commencement time, the candidate must, before the first Monday in June, deposit a bond acceptable to the Comptroller of the University and the Dean of the Graduate School for the cost of printing his thesis, or such part thereof as may be regarded as sufficient to meet the requirements of the rules.

The title page of each thesis must bear the words "Submitted in partial fulfillment of the requirements of the degree of Doctor of Philosophy in—

(here put the major subject), in the Graduate School of the University of Illinois." The title page must also contain the full name of the author, the full title of the thesis, the year of imprint, and, if a reprint, the title, volume, and statement of the pagination of the volume from which it is reprinted. Each thesis must have an appendix giving a short biography of the candidate, including the institutions he has attended, his degrees and honors, the titles of his publications, and such other matters as may be pertinent.

SUMMARY OF ENTRANCE REQUIREMENTS

The entrance requirements summarized below apply to the year 1914-1915 only. A new set of requirements will become effective in September, 1915.

THE UNDERGRADUATE COLLEGES

An applicant for admission must be 16 years of age.

He must offer 15 units¹ of high school work.²

The 15 units must be made up as follows:

- I. Certain subjects *prescribed alike by all the colleges* of the University—see "List A" below.
- II. Certain subjects *prescribed, in addition*, by the individual college which the student wishes to enter—see "Summary by Colleges" below.
- III. Enough *electives* to make up 15 units, to be chosen from "List B" and "List C" below. Not more than two units from "List C" may be offered for the Courses in Literature and Arts, and not more than three units from "List C" for other courses.

LIST A. UNITS PRESCRIBED BY ALL THE UNDERGRADUATE COLLEGES

English composition and rhetoric.....	I	unit
English literature	2	units
Algebra	1½	units
Plane geometry	1	unit
		<hr/>
		5½ units

SUMMARY BY COLLEGES

For the Courses in Literature and Arts:

- I. List A (prescribed by all the Colleges).....5½ units
 - II. Special prescriptions for these Courses—

History	1	unit
Foreign languages ³	3	units
 - III. Electives (not more than 2 units from List C).....5½ units
-
- 15 units

¹A unit is the amount of work represented by the pursuit of one preparatory subject, with the equivalent of five forty-minute recitations a week, through 36 weeks; or, in other words, the work of 180 recitation periods of forty minutes each, or the equivalent in laboratory or other practise.

²Students deficient not more than 2 units may be admitted as *conditioned freshmen*; all conditions must be made up within one year. For methods of removing conditions see paragraph 16, page 9.

³At least two of these must be in the same language. All three units must be in Latin if the student wishes to pursue the study of that subject in the University.

For the Courses in Science and Agriculture:

I. List A (prescribed by all the Colleges).....	5½ units
II. Special prescription for these Courses— Science ¹	2 units
III. Elective (not more than 3 units from List C).....	7½ units
	<hr/> 15 units

For the College of Engineering:

I. List A (prescribed by all departments).....	5½ units
II. Special prescriptions by this College— Solid and spherical geometry.....	½ unit
Physics	1 unit
III. Electives (not more than 3 units from List C).....	8 units
	<hr/> 15 units

For the School of Music:

I. List A (prescribed by all departments).....	5½ units
II. Special prescriptions by this School— History	1 unit
Foreign languages ²	3 units
Music	2 units
III. Electives (not more than 3 units from List C).....	3½ units
	<hr/> 15 units

LIST B. ELECTIVES

Astronomy	18 weeks	½ unit
Botany	18 or 36 weeks	½ or 1 unit
Chemistry	36 weeks	1 unit
Civics	18 or 36 weeks	½ or 1 unit
Commercial geography	18 or 36 weeks	½ or 1 unit
Drawing	18 or 36 weeks	½ or 1 unit
Economics	18 weeks	½ unit
English literature (3rd unit).....	36 weeks	1 unit
French	36 to 144 weeks	1 to 4 units
Geology	18 or 36 weeks	½ or 1 unit
Geometry, solid and spherical.....	18 weeks	½ unit
German	36 to 144 weeks	1 to 4 units
Greek	36 to 108 weeks	1 to 3 units
History	36 to 108 weeks	1 to 3 units
Latin	36 to 144 weeks	1 to 4 units
Physics	36 weeks	1 unit
Physical geography	18 or 36 weeks	½ or 1 unit
Physiology	18 or 36 weeks	½ or 1 unit
Spanish	36 to 72 weeks	1 to 2 units
Trigonometry	18 weeks	½ unit
Zoology	18 or 36 weeks	½ or 1 unit

¹Two units of German are prescribed (as well as two units of science) for admission to the Course in Chemical Engineering.

LIST C. LIMITED ELECTIVES

Agriculture	36 to 72 weeks	1 to 2 units
Bookkeeping	36 weeks	1 unit
Business law	18 weeks	½ unit
Domestic science	36 weeks	1 unit
Manual training	36 to 72 weeks	1 to 2 units

PROFESSIONAL SCHOOLS

THE COLLEGE OF LAW requires, for 1914-1915, *one year (i. e., 30 semester hours)* of college work in arts, letters, and science in an institution having standards equal to those of the University of Illinois. For 1915-1916, and thereafter, *two years (i. e., 60 semester hours)* will be required.

THE SCHOOL OF LIBRARY SCIENCE requires a *Bachelor's Degree* in arts, letters, and science from an institution having standards equal to those of the University of Illinois.

UNIVERSITY HONORS

The University gives public official recognition to such students as attain a high grade of scholarship by the following system of honors.

PRELIMINARY HONORS

ALL COLLEGES

Preliminary Honors are assigned at the completion of the sophomore year on the basis of the average of the grades received during the freshman and sophomore years in all studies except Military and Physical Training. The number of persons to whom honors are awarded may not exceed one-tenth of the membership of the sophomore class. A failure in any subject disqualifies a student from receiving these honors. Preliminary Honors afford an opportunity for sophomores to secure recognition for high scholarship without waiting for graduation.

FRESHMAN HONORS

COLLEGE OF LIBERAL ARTS AND SCIENCES

At the close of each year a list of those members of the freshman class who have made an especially good record in scholarship is prepared. The names of such students are announced at an assembly of the College; notice is also sent in each case to the parent or guardian, and to the principal of the high school of which the student is a graduate.

THE HONOR DEGREE

COLLEGE OF LIBERAL ARTS AND SCIENCES

The faculty of the College of Liberal Arts and Sciences continues the system followed by the former College of Literature and Arts of recommending candidates for the degree of A.B. with honors in a particular subject, under the following conditions:

1. The amount of work required in the honor subject shall be that required for a major in that subject.
2. The candidate must also offer two minor subjects. Not less than 9 hours will be accepted in either subject, and the aggregate for both subjects must be at least 24 hours.
3. The work done in the minor subjects must be of a distinctly superior quality; grades of at least 85 are required in all the minor subjects; especially poor or careless work in any other subject may, by vote of the faculty, cause the honor degree to be withheld.
4. Each candidate is required to present an acceptable thesis in his major subject; the thesis may be written in connection with some recognized course in the department.

5. The honor subjects at present recognized in this College are as follows: the classics (either the classics as a whole, or Greek or Latin separately), economics, education, English, German, French, history, mathematics, philosophy, political science, psychology, sociology. The specific requirements for honors in particular subjects are stated in connection with the description of courses for the several departments, pages — below.

The purpose of these honors is not to encourage premature specialization, but to give special recognition to students who have pursued with success carefully correlated courses of study, and to emphasize the importance, for scholarship in any given subject, of thoro training in other more or less related subjects. Candidates should announce their intention as early as possible in their college course and consult freely with the head of the department concerned in regard to the selection of their studies.

FINAL AND SPECIAL HONORS

COLLEGES OF ENGINEERING, AGRICULTURE, AND LAW, AND SCHOOL OF MUSIC

Final Honors are assigned on graduation on the basis of the average of the grades received during the junior and senior years. The number of persons to whom final honors are awarded may not exceed one-tenth of the membership of the senior class. A failure in any subject during the junior and senior years disqualifies a student from receiving these honors. Final honors are designed especially to favor students whose preparatory education has been so imperfect as to prevent them from receiving preliminary honors.

Special Honors are awarded at the close of the senior year. No student may receive such honors who has not completed, before the beginning of his senior year, at least twenty hours' work in the subject, or group of allied subjects, in which the honors are proposed; he must complete thirty hours' work in the same subject, or group of allied subjects, by the end of his senior year, must do such other work as the professor in charge may assign, and must prepare an acceptable thesis. No student is eligible for special honors, who, during the senior year, has received a grade of less than eighty per cent in any subject. Special honors are planned for especially brilliant students who prefer to concentrate their efforts upon a special course.

A student may be a recipient of both final and special honors.

The names of students receiving honors are published in the Annual Register of the University.

HONORARY SOCIETIES

The honorary societies or fraternities named below are private intercollegiate organizations of students and graduates, having for their primary purpose the recognition and encouragement of excellence in scholarship in various departments of study. Election is in all cases made by the societies themselves in accordance with their own rules. The University assumes no responsibility for their elections.

PHI BETA KAPPA

Each year a certain number of the ranking students of the senior class are elected to membership in the Phi Beta Kappa Society. The number is ordinarily limited to one-fifth of the total membership of the graduating class.

The Phi Beta Kappa Prize

Gamma of Illinois chapter of Phi Beta Kappa offers annually a prize of \$25.00 to that member of Gamma Chapter who at his graduation from the College of Liberal Arts and Sciences gives evidence of greatest promise as a scholar in the domain of liberal arts. The award is based on the following considerations: (a) Class room records; (b) other literary and scholarly activities in the University; (c) an essay, which may be a senior thesis or a term paper. At the discretion of the committee in charge, the award may be withheld if none of the essays appears worthy of the prize. Essays submitted in competition and all correspondence with reference to this prize should be addressed to the Secretary of the Phi Beta Kappa Society, University of Illinois.

SIGMA XI

Members of the senior class who give "promise of marked ability" in scientific investigations are eligible to membership in the Sigma Xi Society, which was founded to encourage research in pure and applied science.

OTHER HONORARY SOCIETIES

Alpha Chi Sigma (Chemical); Alpha Gamma Rho (Agricultural); Alpha Zeta (Agricultural); Beta Gamma Sigma (Commercial); Delta Sigma Rho (Oratorical); Eta Kappa Nu (Electrical Engineering); Gamma Alpha (Scientific); Kappa Delta Pi (Educational); Order of the Coif (Law); Phi Alpha Delta (Law); Phi Delta Phi (Law); Phi Lambda Upsilon (Chemical); Scabbard and Blade (Military); Scarab (Architectural); Sigma Delta Chi (Journalistic); Sigma Mu Rho (Medical); Tau Beta Pi (Engineering); Triangle (Civil Engineering).

DESCRIPTION OF COURSES

EXPLANATION

The arrangement of subjects in the following Description of Courses is alphabetical. The connections of allied departments are indicated by cross references.

Following the description of each course of instruction will be found the requirements, if any, for admission to that particular course. The sequence indicated by these prerequisites must be followed. For instance, under Art and Design 5, Painting, the prerequisites given are Art and Design 1, 2, and 3. These three courses must be completed before Course 5 may be taken.

If a course not required for graduation is selected by fewer than five students it may be withdrawn for the semester.

Graduate courses are numbered upward from 100.

Credit is reckoned in *semester hours*, or simply *hours*. An *hour* is one class period a week for one semester, or the equivalent in laboratory, shop, or drawing room. Graduate work is not recorded in credit hours, nor do the credit hours of undergraduate courses apply to graduate students enrolled in them.

The semester, and the number of *hours* each semester for which the course counts, are shown after each course, thus: *I, II*; (2). The Roman figures indicate semesters; the Arabic numerals in parenthesis indicate *hours* of credit for *each semester* for undergraduates. The omission of a course for the current year is indicated by enclosing the entire description of such a course in brackets.

The various University buildings are designated by the following abbreviations:

Agricultural Building.....	Ag.	Lincoln Hall.....	L.H.
Applied Mechanics Laboratory.....	L.A.M.	Mechanical Engineering Laboratory.....	M.L.
Astronomical Observatory.....	Observatory	Metal Shops.....	M.S.
Ceramics Laboratory.....	Cer.	Natural History Hall.....	N.H.
Chemistry Building.....	Ch.	Physics Laboratory.....	P.L.
Commerce Building.....	Com.	Stock Judging Pavilion.....	S.P.
Electrical Engineering Laboratory.....	E.E.	Transportation Building.....	T.B.
Engineering Hall.....	E.H.	University Hall.....	U.H.
Farm Mechanics Building.....	F.M.	Vegetable Greenhouse.....	V.G.
Floricultural Greenhouses.....	F.G.	Woman's Building.....	W.H.
Library.....	L.	Wood Shops.....	W.S.

ACCOUNTANCY

(See also ECONOMICS.)

WILLIAM ARTHUR CHASE, LL.B., C.P.A., *Lecturer, in charge of work in Accountancy*

GEORGE ENFIELD FRAZER, A.B., LL.B., *Professor*

HIRAM THOMPSON SCOVILL, A.B., *Instructor*

Courses 1, 8, and 9 are open to students in any of the Colleges. Courses 2 and 3 are open to students of business administration only; course 10, to students of engineering only; and course 11, to students of agriculture only.

1a-1b. ELEMENTARY AND INTERMEDIATE ACCOUNTING.—The technique of accounts as covered by the ordinary rules of bookkeeping; the application of those rules to the science of accountancy. If elected this course must be taken throughout the year in order to secure credit. *I, II*; (3).

Prerequisite: Thirty hours of university credit and registration in Economics I.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	1a	3	A, Discussion	2	—	—	—	—	—	308 Com.	} Chase Scovill
			B, Discussion	3	—	—	—	—	—	308 Com.	
			A, Practise	—	2,3	—	2,3	—	—	303 Com.	} Chase, Scovill
			B, Practise	—	—	2,3	—	2,3	—	303 Com.	

SECOND SEMESTER

Accountancy 1b 3 Sections and schedule the same as for 1a (first semester).

2a-2b. **ADVANCED ACCOUNTING AND AUDITING.**—The technique of bookkeeping as applied in accounting in its more advanced stage. If elected this course must be taken throughout the year in order to secure credit. *I, II; (3).*

Prerequisite: Accountancy 1a-1b. Open to students of business administration only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	2a	3	Lecture	—	2	—	—	—	—	308 Com.	Chase
			Discussion	1	—	1	—	—	—	308 Com.	Scovill

SECOND SEMESTER

Accountancy 2b 3 Sections and schedule the same as for 2a (first semester).

3a-3b. **ACCOUNTING PROBLEMS AND AUDITING.**—Modern business organization such as partnership, corporation, and cost accounting; municipal accounting and the accounting of the amalgamation of companies; auditing. If elected this course must be taken throughout the year in order to secure credit. *I, II; (3).*

Prerequisite: Accountancy 2a-2b. Open to students of business administration only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	3a	3	—	1	1	—	—	—	—	307 Com.	Chase

SECOND SEMESTER

Accountancy 3b 3 Schedule the same as for 3a (first semester).

8. **ELEMENTARY GOVERNMENTAL ACCOUNTING.**—Use of government reports; governmental accounting. *I; (2).*

Prerequisite: Accountancy 1a-1b and either concurrent registration or previous credit in Economics 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	8	2	—	—	8	—	8	—	—	307 Com.	Frazer

9. **INSTITUTIONAL ACCOUNTING.**—Functional organization; personnel; budgetary control; purchasing; store-keeping; perpetual inventories. *II; (2).*

Prerequisite: Accountancy 1a-1b and eight hours in economics, political science, or sociology.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	9	2	—	—	8	—	8	—	—	307 Com.	Frazer

10. SHOP MANAGEMENT AND COST KEEPING.—Types of industries; the labor distribution; the materials used. The best types of records suitable for each kind of industry are discussed, and the work is presented from the standpoint of the engineer and shop manager. *II*; (2).

Prerequisite: Open only to engineering students who have had Economics I or 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	10	2	—	—	10	—	10	—	—	308 Com.	Scovill

11. FARM ACCOUNTING.—The best practical system of keeping farm accounts; the designing of accounting systems for different kinds of farm operations and for different kinds of farming. *I*; (2).

Prerequisite: Open to junior and senior students of agriculture only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	11	2	Discussion	—	—	—	—	1	—	308 Com.	Scovill
			Practise	—	—	—	—	—	8,9,10	303 Com.	Scovill

AGRICULTURAL EXTENSION

FRED HENRY RANKIN, *Superintendent and Assistant to the Dean, with rank of Assistant Professor*

ARETAS WILBUR NOLAN, M.S., *Assistant Professor*

ALBERT WOODWARD JAMISON, M.S., *Associate*

JOSEPH HARVEY CHECKLEY, B.S., *Assistant*

WILLIAM PITT MILLER, B.S., *Assistant*

I. PRINCIPLES AND METHODS OF HIGH SCHOOL AGRICULTURE.—Features of agricultural science and practise best adapted to high school conditions; the best order and methods for their presentation; suiting course and instruction to the needs of the school community; what laboratory work shall be given; what apparatus may be used; what field work is practical. Practise teaching provided through co-operation with the local high school. *II*; (5).

Prerequisite: Two years' work in agriculture.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	1	5	—	3	3	3	3	3	—	Ag.	Nolan

3. AGRICULTURAL EXTENSION TEACHINGS.—Extension enterprises and the way in which they may be of service to the people; farmers' institutes; agricultural extension schools; farmers' clubs and co-operative work in rural communities. *II*; (1).

Prerequisite: Agricultural Extension 4-5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	3	1	—	—	—	3	—	—	—	Ag.	} Rankin Jamison

4-5. COUNTRY LIFE PROBLEMS.—Problems of the farm; duties of citizenship; social, economic, and educational work in rural communities. Lectures. Required of all first-year students. *I, II*; ($\frac{1}{2}$).

(Credit given to agricultural freshmen only.)

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Agricultural Extension	4	$\frac{1}{2}$	—	—	—	—	—	3	—	Morrow Hall	Davenport and others

SECOND SEMESTER

Agricultural Extension	5	$\frac{1}{2}$	—	Schedule the same as for 4 (first semester).							
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AGRONOMY

CYRIL GEORGE HOPKINS, Ph.D., *Professor, Agronomy*
 LOUIE HENRIE SMITH, Ph.D., *Professor, Plant Breeding*
 JEREMIAH GEORGE MOSIER, B.S., *Professor, Soil Physics*
 JAMES HARVEY PETTIT, Ph.D., *Professor, Soil Fertility*
 ORA STANLEY FISHER, B.S., *Assistant Professor, Soil Fertility*
 FREDERICK CHARLES BAUER, B.S., *Associate, Soil Fertility*
 ALBERT LEMUEL WHITING, Ph.D., *Associate, Soil Fertility*
 AXEL FERDINAND GUSTAFSON, M.S., *Associate, Soil Physics*
 HAROLD WILSON STEWART, B.S., *Associate, Soil Physics*
 WILLIAM LEONIDAS BURLISON, M.S., *Associate, Crop Production*
 EARL ARCHIBALD WHITE, M.S., *Associate, Farm Mechanics*
 IRA WILMER DICKERSON, B.S., *Associate, Farm Mechanics*
 KARL JOHN THEODORE EKBLAW, B.S., *Associate, Farm Mechanics*
 ELMER TRYON EBERSOL, A.B., B.S., *Instructor, Crop Production*
 CHESTER OTIS REED, B.S., *Instructor, Farm Mechanics*
 MARVIN EDWARD JAHR, A.B., *Instructor, Farm Mechanics*
 FORREST ADDISON FISHER, B.S., *Instructor, Soil Physics*
 CLYDE R. NEWELL, *Instructor, Farm Mechanics*
 HOWARD JOHN SNIDER, B.S., *Assistant, Soil Fertility*
 HARRY CHARLES GILKERSON, B.S., *Assistant, Soil Fertility*
 HARRISON FRED THEODORE FAHRNKOPF, B.S., *Assistant, Soil Fertility*
 WARREN RIPPEY SCHOONOVER, B.S., *Assistant, Soil Fertility*
 ORR MILTON ALLYN, B.S., *Assistant, Crop Production*
 EDWARD HARVEY WALWORTH, B.S., *Assistant, Crop Production*

I. DRAINAGE.—Drainage and its surveying operations. Chaining, mapping, leveling, designing, setting grade stakes, laying tile. Lectures and laboratory first half semester; field work second half semester. *II*; (3).

Prerequisite: Agronomy 9 (Soil Physics), or its equivalent.

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Agronomy	1	3	—	10,11	—	10,11	—	10,11	—	201 F. M.	Jahr

2. **FIELD MACHINERY.**—Construction, principles of operation, adjustment, purchase, and care of implements for soil, seed, and feed preparation, and for seeding, cultivating, harvesting, and handling farm crops. Whiffle-trees and hitches. Lectures and laboratory work including practise in troubles, adjustments, testing, and a detailed study of farm machines which receive power. *I*; (3).

Prerequisite: Agronomy 26 or registration therein, except for seniors.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	2	3	*A, Lecture	—	—	—	—	8	—	F. M.	Reed
			Laboratory	8,9	—	8,9	—	—	—		
			Quiz	—	—	—	—	9	—		
			*B, Lecture	—	—	—	—	8	—		
			Laboratory	—	1,2	—	1,2	—	—		
			Quiz	—	3	—	—	—	—		
			*C, Lecture	1	—	—	—	—	—		
			Laboratory	—	—	1,2	—	1,2	—		
			Quiz	2	—	—	—	—	—		
			*D, Lecture	1	—	—	—	—	—		
			Laboratory	—	8,9	—	8,9	—	—		
			Quiz	—	—	—	—	—	11		

*Sections A and B are for students who have had farm experience equivalent to at least two full years of four consecutive seasons each; sections C and D are for students who have not had the above experience.

3. **FARM POWER MACHINERY.**—Sources of farm power,—the horse as a motor, windmills, waterpower, steam engines, hot-air engines, electric motors,—their theory, operation, and economy. Internal combustion engines and tractors—methods of ignition, theory, operation, and economy. Transmission of farm power and its application to farm operation. Lectures and laboratory. (Alternating with Mechanical Engineering 48 and 49 if desired.) *II*; (3).

Prerequisite: Agronomy 26 or registration therein, except for seniors.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	3	3	A	8,9	—	8,9	—	8,9	—	201 F. M.	Dickerson
			B	1,2	—	1,2	—	1,2	—	201 F. M.	Dickerson

4. **FARM BUILDINGS.**—Construction materials; construction, arrangement, design, and cost estimation of farm buildings, including machine sheds, granaries, cribs, silos, poultry houses, swine houses, various types of barns, and farm residences. Recitations and drafting. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	4	3	—	1,2	—	1,2	—	1,2	—	205 F. M.	Ekblaw

7. **ADVANCED FARM CROPS.**—History and general utility of each crop; its place in systems of farming with reference to rotations, distribution of labor, cost of production, consumption of products and by-products, storage and marketing. Lectures, assigned reading, laboratory and demonstrations. (The schedule is so arranged that this course may be taken in conjunction with Agronomy 22 (Plant Breeding) and students are advised to register for both courses.) *II*; (3).

Prerequisite: Agronomy 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	7	3	—	—	1,2	—	1,2	1,2	—	A. H.	Burlison

8. SPECIAL FARM CROPS.—A study of special crops in which the student is particularly interested. Besides assigned reading on the subject selected, experiments may be carried on by pot culture in the greenhouse or by plots in the field. Under special arrangement part of this work may be done during summer vacation. *II*; *(2 to 5).

Prerequisite: Agronomy 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	8	*2 to 5	—	—	—	—	—	—	—	(Arrange)	Burlison

9. SOIL PHYSICS AND MANAGEMENT.—Origin of soil material; methods of formation; mechanical composition and classification; moisture; texture as affecting capillarity, osmosis, diffusion, temperature, aeration, and as affected by plowing, harrowing, cultivating, rolling, and cropping; wasting by washing, fall or spring plowing and drainage as affecting moisture, temperature, and root development; real and apparent specific gravity, porosity, water holding capacity, and capillary power; the physical effects of different systems of rotation and of continuous cropping with various crops. Lectures; laboratory. *I or II*; (5).

Prerequisite: Chemistry 2 and 3, one unit in entrance physics, and one year of university work. Regular students are urged to take Chemistry 13a previous to this course, others consult instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	9	5	A, Lecture	8	8	8	—	—	—	701 Ag.	Mosier
			B, Lecture	10	10	10	—	—	—	701 Ag.	Mosier
			A, Laboratory	9	—	9	8,9	8,9	—	650 Ag.	} Gustafson Stewart
			B, Laboratory	—	10	10	10,11	10,11	—	650 Ag.	
			A-1, Quiz	—	9	—	—	—	—	302 Ag.	Gustafson
			A-2, Quiz	—	9	—	—	—	—	303 Ag.	Stewart
			A-3, Quiz	—	9	—	—	—	—	128 Ag.	Fisher
			B-1, Quiz	11	—	—	—	—	—	302 Ag.	Gustafson
			B-2, Quiz	11	—	—	—	—	—	303 Ag.	Stewart
			B-3, Quiz	11	—	—	—	—	—	128 Ag.	Fisher

SECOND SEMESTER

Section	M	T	W	T	F	S	Room	Instructor
A, Lecture	8	8	8	—	—	—	702 Ag.	Mosier
A, Laboratory	9	—	9	8,9	8,9	—	650 Ag.	} Gustafson Stewart Fisher
A-1, Quiz	—	9	—	—	—	—	302 Ag.	Gustafson
A-2, Quiz	—	9	—	—	—	—	303 Ag.	Stewart
A-3, Quiz	—	9	—	—	—	—	128 Ag.	Fisher

10. SPECIAL WORK IN SOIL PHYSICS.—Physical properties of special soils; centrifugal analysis of such soils; field observations of the effects of discing, harrowing, and rolling; time and depths of cultivation; soil moisture and temperature; effects of washing of soils; methods of prevention. *I or II*; (2-5).

Prerequisite: Agronomy 9.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	10	2 to 5	—					(Arrange)		650 Ag.	Mosier Gustafson Stewart Fisher

11. SOIL BIOLOGY.—Activities of protozoa, fungi, algae, bacteria and other forms of life occurring in the soil from the standpoint of fertility; fermentation of crop residues, green and farm manures and their effect upon insoluble plant food; fixation of atmospheric nitrogen, its transformations, assimilation, possible losses, and similar studies of the other essential elements. Lectures; laboratory. *II*; (3).

Prerequisite: Agronomy 12 and Bacteriology 5 or Bacteriology 19.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	11	3	A, Lecture	10	—	10	—	—	—	— Ag.	Pettit
			A, Laboratory	8,9	—	8,9	—	—	—	326 Ag.	Whiting
			B, Laboratory	11	—	11	—	10,11	—	326 Ag.	Whiting

12. SOIL FERTILITY, FERTILIZERS, ROTATIONS.—The influence of fertility upon the yield of various crops; effect of different crops upon the soil and upon succeeding crops; different rotations; ultimate effect of different systems of farming upon fertility and productivity; manures and fertilizers, their composition and value; soils cropped continuously with different crops and with a series of crops; the fertility of soils of different types or classes from different sections of Illinois. Lectures; laboratory. *II*; (5).

Prerequisite: Chemistry 13a; Agronomy 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	12	5	Lecture	8,9	—	8,9	—	—	—	703 Ag.	Hopkins
			A, Laboratory	—	8,9	—	8,9	8,9	—	218 Ag.	Bauer
			B, Laboratory	—	8,9	—	8,9	8,9	—	650 Ag.	Fisher
			C, Laboratory	—	3,4	—	3,4	3,4	—	218 Ag.	Bauer

13. INVESTIGATION OF THE FERTILITY OF SPECIAL SOILS.—Soils in which the student is particularly interested. Determination of the nature and quantity of the elements of fertility; effect upon various crops of different fertilizers added to the soils, as determined by pot cultures, and by plot experiments; systematic study of similar work of experiment stations and experimenters. *I*; *(2, 3, 4, 5).

Prerequisite: Agronomy 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	13	*2,3,4,5	—					(Arrange)		218 Ag.	Pettit, Whiting

16. GERMAN AGRICULTURAL READINGS.—Special attention to soils and crops. The current numbers of German journals of agricultural science used as texts. *II*; (2).

Prerequisite: Two years' work in German; Agronomy 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	16	2	—					(Arrange)		214 Ag.	Hopkins

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17. HARVESTING MACHINERY.—Expert work on grain binders, corn binders, mowers, hay rakes, loaders, and stackers. (For students preparing to do expert work on these machines in the field. Before registering in this course students are requested to consult instructor regarding requirements for successful experting.) *II*; (3).

Prerequisite: M. E. 81; Agronomy 2, and Agronomy 3, or registration therein.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	17	3	A	—	8,9	—	8,9	—	8,9	F. M.	Reed
			B	—	1,2	—	1,2	—	10,11	F. M.	Reed

18a-18b. INVESTIGATION AND THESIS.—*I, II*; *(5-10).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	18a	*5 to 10	—								

(Arrange)

SECOND SEMESTER

Agronomy	18b	*5 to 10	—								
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(Arrange)

Hopkins
Mosier
Smith
Pettit
Ekblaw

19a-19b. RESEARCH WORK IN FARM MECHANICS.—Consult instructor regarding time and requirements. *I, II*; *(1-5).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	19a	*1 to 5	—								

(Arrange)

SECOND SEMESTER

Agronomy	19b	*1 to 5	—								
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(Arrange)

Ekblaw
Dickerson
Jahr
Reed

20. FARM CONCRETE CONSTRUCTION.—Materials used in concrete construction; methods of mixing and placing; simple comparative tests; specifications and estimates for all kinds of farm concrete construction. Lectures and laboratory. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	20	2	A	—	10,11	—	10,11	—	—	201 F. M.	Ekblaw
			B	—	1,2	—	1,2	—	—	201 F. M.	Ekblaw

22. PLANT BREEDING.—The improvement by breeding of field crops, including grains, grasses, and legumes; general principles involved with practical applications of the same. Lectures, assigned reading, demonstrations and laboratory.

(Schedule is so arranged that this course may be taken in conjunction with Agronomy.7.) *II*; (2).

Prerequisite: Botany 1; Chemistry 13a; Agronomy 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	22	2	—	1,2	—	1,2	—	—	—	Ag.	Smith

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23. PLANT FOOD SUPPLIES.—The world's supply of plant-food materials; utilization and conservation. *II*; (1).

Prerequisite: Agronomy 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	23	1	—							316 Ag.	Pettit

25. FARM CROPS.—Plant growth; structure; habits and requirements; preparation of the seed bed; seed selection for productiveness; grading and fanning of grain as a means of improvement; storing; care of stored grain to prevent deterioration in vitality, or loss in market requirements; market grades of grain and grain judging; examination of grains for purity; testing for vitality; weeds, identification, methods of distribution, eradication, control; diseases of farm crops and methods of prevention. *I or II*; (4).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	25	4	A, Lecture	3	—	3	—	—	—	701 Ag.	Burlison
			A, Laboratory	—	8,9	—	8,9	—	—	600 Ag.	Walworth
			B, Lecture	—	3	—	3	—	—	701 Ag.	Burlison
			B, Laboratory	—	1,2	—	1,2	—	—	600 Ag.	Walworth

Note.—Students registering in a given lecture section must, if possible, register in the corresponding laboratory section.

26. ELEMENTARY FARM MECHANICS.—An elementary course in farm mechanics, including work upon ropes, soldering, babbitting, belt lacing, pipe cutting, plumbing, sewage disposal, farm water systems, lighting systems, heating systems, power transmission, elementary mechanics, and equalizers. Design of farm power plant. *I or II*; (3).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	26	3	A, Quiz	—	8	—	—	3	—	201 F. M.	Ekblaw
			Drafting	—	9	—	—	—	—		
			Laboratory	—	—	—	8,9	—	—		
			B, Quiz	—	—	10	—	10	—		
			Drafting	—	—	—	—	11	—		
			Laboratory	10,11	—	—	—	—	—		
			C, Quiz	2	—	—	—	2	—		
			Drafting	—	—	—	—	1	—		
			Laboratory	—	—	1,2	—	—	—		

27. DRAINAGE DESIGN.—Designing tile drainage systems from level note data and contour maps; estimating sizes, amounts, and cost of tile, and cost of system complete; designing outlet open ditch system for drainage districts, estimating sizes and costs; drainage district laws; preparing bids on contract jobs, advanced field work. *I*; *(1-5).

Prerequisite: Agronomy 1, or C. E. 96, C. E. 31, or C. E. 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	27	*1 to 5	—							205 F. M.	Jahr

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

COURSES FOR GRADUATES

101. SOIL INVESTIGATIONS.—Systems of soil investigations; sources of error and methods of control; interpretation of results. *II*; ($\frac{1}{2}$ to 1 unit.)

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	101 $\frac{1}{2}$ to 1 unit	—					(Arrange)		214 Ag.	Hopkins

103. SOIL HISTORY.—Different systems of agricultural practise and their ultimate effect upon the soil. *II*; ($\frac{1}{2}$ to 1 unit).

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	103 $\frac{1}{2}$ to 1 unit	—					(Arrange)		214 Ag.	Hopkins

112. PLANT BREEDING.—A detailed study of experiments at this station; methods and results reported from other states and from foreign countries. *I, II*; ($\frac{1}{2}$ to 2 units).

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	112 $\frac{1}{2}$ to 2 units	—					(Arrange)		214 Ag.	Smith

118. INVESTIGATION.—*I, II*; (1 to 2 units).

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	118 1 to 2 units	—					(Arrange)		} Ag.	Hopkins
										Smith
										Pettit
										Mosier
										Whiting

ANIMAL HUSBANDRY

(Including FARM MANAGEMENT)

HERBERT WINDSOR MUMFORD, B.S., *Professor, Animal Husbandry*
 HARRY SANDS GRINDLEY, D.Sc., *Professor, Animal Nutrition*
 WALTER CASTELLA COFFEY, M.S., *Professor, Sheep Husbandry*
 HENRY PERLY RUSK, M.S., *Assistant Professor, Cattle Husbandry*
 JAMES LLOYD EDMONDS, B.S., *Assistant Professor, Horse Husbandry*
 JOHN A. DETLEFSEN, D.Sc., *Assistant Professor, Genetics*
 DANIEL OTIS BARTO, B.S., *Associate, Poultry Husbandry*
 WALTER FREDERICK HANDSCHIN, B.S., *Associate, Animal Husbandry*
 WALTER EDWARD JOSEPH, Ph.D., *Associate, Animal Husbandry*
 SLEETER BULL, M.S., *Associate, Animal Nutrition*
 WILLIAM HERSCHEL SMITH, M.S., *Instructor, Animal Husbandry*
 ELMER ROBERTS, B.S., *Instructor, Genetics*
 WILBUR JEROME CARMICHAEL, B.S., *Assistant, Animal Husbandry*
 JOHN JONATHAN YOKE, B.S., *Assistant, Animal Husbandry*
 JOHN RICHARD WELLS, B.S., *Assistant, Animal Husbandry*
 CHARLES IVAN NEWLIN, M.S., *Assistant, Animal Husbandry*

COURSES FOR UNDERGRADUATES

- Beef Cattle: Animal Husbandry 11a, 11b.
 Breeding, Feeding, Management, and Marketing: Animal Husbandry 6, 28, 29, 30, 32; Farm Management 1.
 General Judging: Animal Husbandry 1a, 2a, 4a, 5, 11a, 22.
 Genetics: Animal Husbandry 30.
 Horses: Animal Husbandry 4a, 4b, 17.
 Meat: Animal Husbandry 10, 24.
 Nutrition: Animal Husbandry 7, 31.
 Poultry: Animal Husbandry 23.
 Sheep: Animal Husbandry 1a, 1b, 25, 27
 Swine: Animal Husbandry 2a, 2b, 26.

NOTE.—Students registered in advanced courses such as 10, 22, 23, 28, 29, 32, and Farm Management 1, will be required to participate in a tour of inspection of representative markets, farms, herds, flocks, and studs.

1a. SHEEP: BREEDS AND MARKET CLASSES.—Breeds used for mutton and wool production; type, characteristics, and adaptability; market classes and grades of sheep and wool. Lectures; judging. *I*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	1a	2	—	—	10,11	—	10,11	—	—	S. P.	Coffey

1b. SHEEP: BREEDING, FEEDING, AND MANAGEMENT.—Pure bred and grade flocks: feeding, housing, and shepherding. Lectures; reference readings. *I*; (3).

Prerequisite: Animal Husbandry 5 and 6 or their equivalents.

It is advisable to take 1a and 1b simultaneously.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	1b	3	—	10	—	10	—	10	—	553 Ag.	Coffey

2a. SWINE: BREEDS AND MARKET CLASSES.—History of the leading breeds: type, characteristics, and adaptability; market classes and grades; market reports. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	2a	2	—	—	10,11	—	10,11	—	—	S. P.	Carmichael

2b. SWINE HUSBANDRY.—Swine raising from the standpoint of market requirements and of economic production; breeding, housing, care, and feeding of swine for breeding purposes. *II*; (3).

Prerequisite: Animal Husbandry 5 and 6, or their equivalents.

It is advisable to take 2a and 2b simultaneously.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	2b	3	—	10	—	10	—	10	—	702 Ag.	Carmichael

4a. BREEDS OF HORSES AND MARKET CLASSES OF HORSES AND MULES.—History of the leading breeds; types, characteristics, and adaptability; market classes, grades, and requirements. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5, or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	4a	2	—	—	1,2	—	1,2	—	—	S. P.	Edmonds, Yoke

4b. BREEDING, FEEDING, AND MANAGEMENT OF HORSES.—Methods: care of stallions, mares, and foals; of work horses and drivers at labor and idle; fattening horses for market. Lectures; assigned readings. *II*; (3).

Prerequisite: Animal Husbandry 5 and 6, or their equivalents.

It is advisable to take 4a and 4b simultaneously.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	4b	3	—	1	—	1	—	1	—	S. P.	Edmonds, Yoke

5. FUNDAMENTALS OF LIVE STOCK JUDGING.—The names and location of external parts of the various kinds of live stock, the use of the score card, comparative judging as a method, breed identification, and types of farm animals. Required in freshman year. *I or II*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	5	3	A	8,9	—	8,9	—	8,9	—	S. P.	Coffey and others
			B	10,11	—	10,11	—	10,11	—	S. P.	

SECOND SEMESTER

A	8,9	—	8,9	—	8,9	—	S. P.	Coffey and others
B	1,2	—	1,2	—	1,2	—	S. P.	

6. PRINCIPLES OF FEEDING AND BREEDING.—Classification, digestibility, and functions of feed nutrients; classification and feeding values of feed stuffs; feed requirements and calculation of balanced rations for farm animals.

Evolution of domesticated animals; history of systematic breeding and improvement; unit characters; range of variability; effects of selection; systems of breeding. Required in sophomore year. *I*; (3).

Prerequisite: First year men must have permission of Mr. Bull.

NOTE.—It is imperative that the quiz and laboratory sections of a student bear the same letter.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	6	3	Lecture	—	—	8	—	—	—	702 Ag.	Bull
			A & B Quiz	8	—	—	—	8	—		Bull Joseph Newlin
			C & D Quiz	—	8	—	8	—	—		
			A, Laboratory	—	—	—	—	—	8,9		
			B, Laboratory	—	—	—	1,2	—	—		
			C, Laboratory	8,9	—	—	—	—	—		
			D, Laboratory	—	—	—	—	8,9	—		

7. **PRINCIPLES OF ANIMAL NUTRITION.**—Composition and fuel value of feeding stuffs; organic and inorganic food stuffs; digestion, absorption, and metabolism; elimination of metabolic products; co-efficients of digestibility and nutritive value of feeding stuffs. *I*; (3).

Prerequisite: Animal Husbandry 6 (or course formerly known as Animal Husbandry 21); Chemistry 13a.

NOTE.—All students registered previous to September, 1912, will be required to register for only 3 hours' credit, the laboratory being elective. All other students electing this course will be required to register for 5 hours' credit, which includes the laboratory work.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	7	3	Lecture	—	—	11	—	—	—	702 Ag.	Grindley
			A, Quiz	11	—	—	—	11	—		
			B, Quiz	11	—	—	—	11	—		
			C, Quiz	11	—	—	—	11	—		
			D, Quiz	—	11	—	11	—	—		
			E, Quiz	—	11	—	11	—	—		
			A, Lab.	10,11	—	—	—	10,11	—		
			B, Lab.	—	8,9	—	8,9	—	—		
			C, Lab.	—	1,2	—	1,2	—	—		
											Joseph Bull Mitchell

9. INVESTIGATION AND THESIS.—*I* or *II*; *(5-10).

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	9	*5 to 10	—				(Arrange)				

10. **MEAT.**—Farm butchering, curing, and care of meats; yield, quality and values of meat and by-products, as related to breeding, feeding, and health of animals; classes, grades, and cuts of meat in wholesale and retail markets. The class will leave on its annual Chicago trip, Thursday morning, April 1, 1915. The cost will be about \$8.00. *II*; (3).

Prerequisite: Two years of university work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	10	3	—	—	9	—	9	—	8,9	128 Ag.	Coffey

11a. **BEEF CATTLE.**—Breeds and market classes; history of the leading breeds; beef type from the standpoint of the butcher, the feeder, and the breeder; classification and value of each grade according to current market reports. Judging; lectures; quizzes; assigned readings. *I*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	11a	2	—	—	1,2	—	1,2	—	—	S. P.	Rusk, Smith

11b. **BEEF PRODUCTION.**—Breeding and management of pure bred herds; breeding for market; combined beef and milk production; economic factors in cattle feeding; influence of age, grade, breed, condition, and sex; equipment;

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

pork and manure as by-products of beef production. Lectures; quizzes; assigned readings (text book). *I*; (3).

Prerequisite: Animal Husbandry 5 and 6, or their equivalents.

It is advisable to take 11a and 11b simultaneously.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	11b	3	—	1	—	1	—	1	—	702 Ag.	Rusk, Smith

15. DAIRY CATTLE.—(See Dairy Husbandry 2 and 16.)

[17. EDUCATION AND DRIVING OF THE HORSE.—Mental qualities, peculiarities, and limitations of the horse; education and training for labor or the road; correct driving; responsibilities of the driver; courtesies of the highway. Lectures; readings; practise. *II*; (2). Not given, 1914-15.

Assistant Professor EDMONDS

Prerequisite: Animal Husbandry 4a and 4b; three semesters' work in the University or its equivalent.]

22. ADVANCED STOCK JUDGING.—Animal conformation, quality, and condition with reference to market and show yard requirements; the selection of horses, beef cattle, sheep, and swine, for feed lot, market, and exhibition; judging at live stock shows. Dec. 21, 22, and 23, 1914, will be spent in visiting breeders in northern Illinois, and southern Wisconsin, also in a visit to the University of Wisconsin. The cost of this trip will be about \$25.00. *I*; (3).

Prerequisite: Animal Husbandry 1a, 2a, 4a, 11a, or their equivalents.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	22	3	—	3	3	3	3	3	—	S. P.	Mumford

23. POULTRY: TYPES, BREEDS, AND VARIETIES.—Exhibiting and judging; principles of breeding; poultry houses and equipment; feeding, hatching, and brooding; market eggs and poultry; crate-fattening and dressing; diseases and their treatment. On Saturday, March 6, the class will go to Mattoon, and on Saturday, May 1, they will go to Bloomington. The cost of these trips will be less than \$8.00. *II*; (5).

Prerequisite: Animal Husbandry 5, or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	23	5	—	11	11	11	11	11	—	S. P.	Barto

[24. MEAT.—Influence of type, condition, age, sex, and feeds upon the yield and market grade of meat products. *II*; *(2-5).

Not given, 1914-15.

Professor COFFEY

Prerequisite: Animal Husbandry 10, and 1a or 2a or 11a, three years' work in the University, or its equivalent.]

25. WOOL.—Factors affecting quality, quantity, strength, and condition of wool. *II*; *(2-5). Offered in alternate years, beginning second semester, 1914-15.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Prerequisite: Animal Husbandry 1a, 1b; three years work in the University, or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	25	*2 to 5	—							(Arrange)	Coffey

26. SWINE HUSBANDRY.—Special problems in swine production. *II*; *(2-5).

Prerequisite: Animal Husbandry 2a, 2b; three years' work in the University, or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	26	*2 to 5	—							(Arrange)	Carmichael

[27. SHEEP HUSBANDRY.—Factors determining the importance of the industry in leading sheep growing countries, particularly different parts of the United States. *II*; *(2-5). Offered in alternate years, beginning second semester, 1913-14. Professor COFFEY

Prerequisite: Animal Husbandry 1a, 1b; three years' work in the University, or its equivalent.]

28. ADVANCED HISTORY OF BREEDS OF LIVE STOCK.—Horses, beef cattle, sheep, and swine. Methods of great breeders; performances and pedigrees of famous animals; breed type as exemplified in the University and other herds. Lectures; assigned readings; problems. Dec. 21, 22, and 23, 1914, will be spent in visiting breeders in northern Illinois and southern Wisconsin, also in a visit to the University of Wisconsin. The cost of the trip will be about \$25.00. *I*; *(3-5).

Breeds offered, 1914-15

Beef cattle.....	Shorthorns, Aberdeen Angus
Horses.....	Percherons, Belgians, Standard breeds
Swine.....	Berkshires, Duroc Jerseys
Sheep	Shropshires, Southdowns

Breeds offered 1915-16

Beef cattle.....	Herefords, Galloways
Horses.....	Shires, Clydesdales, American Saddlebreds
Swine.....	Poland Chinas, Chester Whites
Sheep.....	Rambouillets, Oxford Downs

Prerequisite: "a" and "b" courses in class of live stock elected. See note at the beginning of the description of animal husbandry courses.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	28	*3 to 5	—	9	—	9	—	9	—	128 Ag.	Mumford

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

29. **SYSTEMS OF LIVE STOCK FARMING.**—Management in live stock farming. Climate, soil, topography, location with reference to markets; the supply of land, labor, capital, and managing ability as factors in influencing the choice and adaptation of the various systems of live stock production. Planning of farms for mixed and live stock systems. The class will visit some of the farms included in the Farm Management investigations being conducted by the department. This trip will cost about \$15.00. *II*; (2).

Prerequisite: Animal Husbandry 5 and 6, and 6 hours' credit from 1b, 2b, 4b, or 11b. Farm Management 1. See note at beginning of description of animal husbandry courses.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	29	2	—	8	—	8	—	—	—	128 Ag.	Handschin

30. **GENETICS.**—Heredity; variation; Mendel's and Galton's Laws; dominance and segregation; gametic coupling and spurious allelomorphism; correlation; mutation theory; inheritance of acquired characters; pure lines, selection, variability; modification of unit-factors, etc. Practical application to breeding. Lectures; laboratory. *II*; (5).

Prerequisite: Two years of university work, including ten hours in biology. Before registering in this course the approval of Dr. Detlefsen must be secured.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	30	5	—	11	11	11	11	11	—	702 Ag.	Detlefsen

31. **PRINCIPLES OF ANIMAL NUTRITION.**—(Continuation of course 7). Carbohydrate, fat, protein, and mineral metabolism. The income and expenditure of matter and energy. Protein, mineral, and energy requirements for maintenance, growth, and production. Lecture; recitations; laboratory. *I or II*; *(2-5).

Prerequisite: Animal Husbandry 7.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	31	*2 to 5	—							(Arrange)	Grindley

[32. **MARKETING LIVE STOCK.**—Markets and methods of marketing live stock and their products. Advertising and sale of surplus pedigreed live stock. Certain inspection trips will be required of the class. The expense of these trips will be about \$15.00. *II*; (2).

Professor MUMFORD, Mr. SIMPSON

Prerequisite: Two years of university work. At least 4 credits in Animal Husbandry courses 1a, 2a, 4a and 11a. See note at beginning of description of animal husbandry courses. Not given in 1914-15.]

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FARM MANAGEMENT

I. ELEMENTARY FARM MANAGEMENT.—The factors of production in the farm business; systems of farming, their distribution, and adaptation; farm organization; the distribution of capital invested; planning of the farm; farm administration or operation; planning of work; handling of labor; developing management efficiency. Lectures; quiz. The trip required in this course is the same as in Animal Husbandry 29. II; (3).

Prerequisite: Three semesters of required work; Economics 1 or 2.

It is also very important that the student have credit or be registered in Accountancy 11 and Agronomy 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Farm Management	1	3	—	2	—	2	—	2	—	702 Ag.	Handschin

ARCHITECTURE

LORING HARVEY PROVINE, B.S., A.E., *Professor*

NATHAN CLIFFORD RICKER, D.Arch., *Professor*

NEWTON ALONZO WELLS, M.P., *Professor, Architectural Decoration*

PERCY ASH, B.S., C.E., *Assistant Professor, Architectural Design*

WILLIAM CALDWELL TITCOMB, A.B., B.S., *Assistant Professor of Architecture*

CHARLES RICHARD CLARK, B.S., *Associate, Architectural Construction*

ROBERT TAYLOR JONES, B.S., *Instructor*

JOSEPH MITCHELL KELLOGG, M.Arch., *Instructor, Architectural Design*

FREDERICK KITSON COWLEY, *Instructor*

SAMUEL CHATWOOD BURTON, *Instructor*

ANGELO BENEDETTO MARINO CORRUBIA, B.S., M.S., *Instructor*

EARLE ROBINSON MATH, B.S., *Assistant, Architectural Engineering*

RALPH EDWARD MUEHLMAN, *Assistant, Architectural Design*

WINIFRED FEHRENKAMP, B.L.S., *Librarian*

6a-6b. HISTORY OF ARCHITECTURE.—From the Egyptian period to modern times; effects of political, economic, and local conditions; influence of materials, climate, structural systems; architecture of the various countries and periods; evolution of architectural forms. Illustrated lectures; quizzes. (For architectural engineers.) I, II; (4).

Prerequisite: Sophomore standing in architecture or architectural engineering.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	6a	4	C	9	9	9	9	—	—	221 E. H.	Ricker

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	6b	4	C	9	9	9	9	—	—	221 E. H.	Ricker

11a-11b. SEMINAR.—Assigned topics in History of Architecture; review of books; abstracts of current technical journals and other publications. I, II; (1).

Prerequisite: Registration in Architecture 6a-6b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	11a	1	C	—	—	10	—	—	—	221 E. H.	Ricker

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	11b	1	C	—	—	10	—	—	—	221 E. H.	Ricker

13, 14, 15, 16. HISTORY OF ARCHITECTURE.—Covers approximately the same ground as Architecture 6a-6b. (For architects.) *Sophomore I, II; Junior I, II; (2).*

Prerequisite: Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	13	2	A,B,C,D	11	—	11	—	—	—	221 E. H.	Ricker

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	14	2	A,B,C,D	11	—	11	—	—	—	221 E. H.	Ricker

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	15	2	—	—	10	—	10	—	—	221 E. H.	Ricker

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	16	2	A	—	10	—	10	—	—	221 E. H.	Ricker

23-24. FREEHAND DRAWING.—Charcoal drawing from the cast. *Six hours drawing per week. I, II; (2).*

Prerequisite: Architecture 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	23	2	A	1-4	—	—	1-4	—	—	405 E. H.	Burton
			B	—	1-4	—	—	1-4	—	405 E. H.	Burton

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	24	2	A	1-4	—	—	1-4	—	—	418 E. H.	Burton
			B	—	1-4	—	—	1-4	—	418 E. H.	Burton

25-26. FREEHAND DRAWING.—Charcoal, pen, pencil, and water color drawing from the cast and from still life. Out-of-door sketching. *Six hours drawing per week. I, II; (2).*

Prerequisite: Architecture 23-24.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	25	2	A	—	8-10	—	8-10	—	8-10	405 E. H.	Wells,
				—	8-10	—	8-10	—	8-10	406 E. H.	Burton

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	26	2	A	—	8-10	—	8-10	—	8-10	406 E. H.	Wells,
				—	8-10	—	8-10	—	8-10	418 E. H.	Burton

27-28. FREEHAND DRAWING.—Water color drawing; original decorative composition; out-of-door sketching. *Six hours drawing per week. I, II; (2).*

Prerequisite: Architecture 25-26.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	27	2	A	—	1-4	—	1-4	—	—	406 E. H.	Burton, Wells

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	28	2	A	—	1-4	—	1-4	—	—	406 E. H.	Wells, Burton

31. ARCHITECTURAL AND FREEHAND DRAWING.—Practise with instruments, pen, pencil, and brush; lettering; shades and shadows; perspective. Charcoal drawing from the cast. *One lecture and ten hours drawing per week. I; (4).*

Prerequisite: Registration in G. E. D. 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	31	4	1	—	—	—	—	3	—	221 E. H.	Cowley
			1	8-10	—	—	—	8-10	—	405 E. H.	
			1	—	8-11	—	8-11	—	—	319 E. H.	
			2	—	—	—	—	3	—	221 E. H.	
			2	10-12	—	—	—	10-12	—	405 E. H.	
			2	—	1-4	—	1-4	—	—	319 E. H.	
			3	—	—	—	—	3	—	221 E. H.	
			3	—	—	—	—	1-3	10-12	406 E. H.	
			3	1-4	—	1-4	—	—	—	319 E. H.	

32. ARCHITECTURAL AND FREEHAND DRAWING.—Elements of architecture; walls, moldings, doors, windows, the Orders, vaults, roofs, stairs. Wash rendering, stereotomy, charcoal drawing from the cast. Lectures and sketching. *One lecture and ten hours of drawing per week. II; (4).*

Prerequisite: Architecture 31.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	32	4	1	—	—	—	—	3	—	221 E. H.	Cowley
			1	8-10	—	—	—	8-10	—	418 E. H.	
			1	—	8-11	—	8-11	—	—	405 E. H.	
			2	—	—	—	—	3	—	221 E. H.	
			2	10-12	—	—	—	10-12	—	418 E. H.	
			2	—	1-4	—	1-4	—	—	405 E. H.	
			3	—	—	—	—	3	—	221 E. H.	
			3	—	—	—	—	1-3	10-12	406 E. H.	
			3	1-4	—	1-4	—	—	—	405 E. H.	

33, 34. DESIGN.—(Elementary). Rendered order problems and sketch problems involving simple composition; library research in elements of composition. *Nine hours drafting room per week. I, II; (3).*

Prerequisite: Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	33	3	A	—	1-4	1-4	—	8	8-11	319 E. H.	Titcomb Kellogg Corrubia
				—	—	—	—	—	—	400 E. H.	
			B	1-4	—	1-4	1-4	8	—	319 E. H.	
				—	—	—	—	—	—	100 E. H.	

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	34	3	A	—	1-4	1-4	—	8	8-11	319 E. H.	} Titcomb Kellogg Corrubia
										400 E. H.	
			B	1-4	—	1-4	1-4	8	—	319 E. H. 400 E. H.	

34a. ARCHITECTURAL ENGINEERING SEMINAR.—Current literature; written reports and discussions. *I*; (1).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	34a	1	C	—	—	10	—	—	—	400 E. H.	Provine

35-36. DESIGN.—(Intermediate). Rendered plan problems and sketch problems; library research in plan and interior elements. *Fifteen hours drafting room per week. I, II; (5).*

Prerequisite: Architecture 33-34.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	35	5	A	1-4	1-4	1-4	1-4	1-4	—	407 E. H.	} Titcomb Kellogg Corrubia

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	36	5	A	1-4	1-4	1-4	1-4	1-4	—	407 E. H.	} Titcomb Kellogg Corrubia

37. DESIGN.—(Advanced). Extended problems in original design. *Twenty-one hours drafting room per week. I; (7).*

Prerequisite: Architecture 35-36.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	37	7	A	1-4	8-11	1-4	8-11	8-11	8-11	408 E. H.	Ash

38. ADVANCED DESIGN OR THESIS.—The working out of an extended original problem in design or construction. *Twenty-one hours drafting room per week. II; (7).*

Prerequisite: Architecture 37.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	38	7	A	1-4	8-10	1-4	8-11	8-11	8-11	408 E. H.	Ash

43. WORKING DRAWINGS.—The growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; detailing at large scale various parts: floors, walls, roofs, doors, windows, cornices, stairs, wainscoting, cabinet-work, interior finish; preparation of working drawings. *Kidder's Building Construction, Part II. Two lectures and four hours drawing per week. I; (3).*

Prerequisite: General Engineering Drawing 2; Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	43	3	A	—	8	—	8	—	—	422 E. H.	} Jones
				—	9-11	—	9-11	—	—	211 E. H.	
			B	8	—	8	—	—	—	422 E. H.	
				9-11	—	9-11	—	—	—	211 E. H.	

44. WORKING DRAWINGS.—Foundations of stone, brick, concrete, and piles; materials employed in stone masonry; their uses, defects, qualities, and modes of preparation; kinds of masonry and external finish; tools for stone cutting and their use; brick masonry, its materials and bonds; terra-cotta design, manufacture, and use; detailing of columns, beams, girders, and footings; joints and connections. Preparation of working drawings. Kidder's *Building Construction and Superintendence. Part I. Two lectures and four hours drawing per week. II; (3).*

Prerequisite: General Engineering Drawing 2; Architecture 31, 32, 43.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	44	3	A	—	8	—	8	—	—	422 E. H.	} Jones
				—	9-11	—	9-11	—	—	319 E. H.	
			B	8	—	8	—	—	—	422 E. H.	
				9-11	—	9-11	—	—	—	319 E. H.	

45. GRAPHIC STATICS.—Elements of graphic statics and their application in the analysis of trussed roofs, steel and masonry arches, domes. The graphical representation of reactions, bending moments, shear and deflection in beams. (For architects.) Ricker's *Notes on Graphic Statics. One lecture and six hours drawing per week. I; (3).*

Prerequisite: Theoretical and Applied Mechanics 14, 15, 16.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	45	3	A	—	—	10	—	—	—	422 E. H.	Clark
				8-10	—	8-10	—	8-10	—	407 E. H.	Clark

46. STRUCTURES.—Design of wooden and steel roofs; determination of section of members; design of joints; mill and steel skeleton construction. *One lecture and six hours drawing per week. II; (3).*

Prerequisite: Architecture 45.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	46	3	A	8-10	—	8-10	—	8-10	—	407 E. H.	Clark
				—	—	10	—	—	—	422 E. H.	Clark

55. BUILDING SANITATION.—(For architects.) Plumbing, trap ventilation, removal of wastes; construction of water closets; drains, and systems of water supply; sewage disposal; water supply and fixtures in dwellings. (For architectural engineers.) Cosgrove's *Principles and Practice of Plumbing. Recitations; lectures; designs for special problems. I; (1).*

Prerequisite: Physics 9a-9b, 10a-10b; Architecture 43, 44.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	55	1	A	11	—	—	—	—	—	400 E. H.	Clark

59. DOMESTIC ARCHITECTURE.—(Given in connection with Household Science 2.) Lectures; criticism.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	59	—	—					(Arrange)		221 E. H.	Ash, Clark, Jones

60. SPECIAL LECTURES.—Lectures on Estimating (For architects.) *One lecture per week. II; (1).*

Prerequisite: Senior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	60	1	A	—	10	—	—	—	—	422 E. H.	Provine

65-66. THEORY OF ARCHITECTURE.—Influence of function on architectural form; theory of architectural composition in plan and elevation; problem analysis. Lectures; research; exercises. *I, II; (1).*

Prerequisite: Architecture 33, 34.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	65	1	A	10	—	—	—	—	—	400 E. H.	Titcomb

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	66	1	A	11	—	—	—	—	—	422 E. H.	Titcomb

67. THEORY OF FORM AND COLOR.—Principles underlying pleasing arrangements of form and color; rhythm and sequence; harmony and contrast; proportion and balance. Lectures; exercises. *I; (2).*

Prerequisite: Architecture 25, 26, 35, 36.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	67	2	A	—	11	—	11	—	—	400 E. H.	Wells, Burton

68. SPECIFICATIONS.—The general and special clauses of specifications and their arrangement; methods of classifying material to facilitate writing specifications. Practise in writing several sets; relations of the architect, owner, and builder; office organization; building ordinances; professional ethics. *II; (3).*

Prerequisite: First three years of the courses in Architecture or Architectural Engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	68	3	C	—	11	11	11	—	—	422 E. H.	Provine, Clark

COURSES FOR GRADUATES

Entrance upon graduate work in architecture presupposes the full undergraduate course in that subject. Semi-weekly conferences are held and additional instruction given in all courses as may be required.

101. ARCHITECTURAL CONSTRUCTION.—Design of special structures. *Arrange hours; I, II.*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	101	—	—							(Arrange)	Ricker, Provine

102. SANITATION OF BUILDINGS.—The planning of sanitation, warming, and ventilation, for buildings of importance. *Arrange hours; I, II.*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	102	—	—							(Arrange)	Ricker, Clark

103. ADVANCED ARCHITECTURAL GRAPHICS.—Advanced work in graphic statics, stereotomy, perspective, water color, and free-hand drawing. *Arrange hours; I or II.*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	103	—	—							(Arrange)	Ricker, Provine

104. ARCHITECTURAL DESIGN.—Advanced architectural design. *Arrange hours; I or II.*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	104	—	—							(Arrange)	Ash

105. ARCHITECTURAL PRACTISE.—Contracts, specifications, and office methods; architectural jurisprudence. *Arrange hours; I or II.*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	105	—	—							(Arrange)	Ricker, Provine

106. ADVANCED ARCHITECTURAL HISTORY.—Special research in architectural history. *Arrange hours; I or II.*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	106	—	—							(Arrange)	Ricker, Ash

ARCHITECTURAL ENGINEERING

31. ARCHITECTURAL AND FREEHAND DRAWING. (Architectural Drawing for Architectural Engineers).—Practise with instruments, pen, pencil, and brush; lettering; shades and shadows; perspective. Charcoal drawing from the cast. *One lecture and ten hours drawing per week. I; (4).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	31	4	4	—	3	—	—	—	—	221 E. H.	Cowley
			4	—	—	8-10	—	—	8-10	418 E. H.	
			4	8-11	—	—	—	8-11	—	319 E. H.	
			5	—	3	—	—	—	—	221 E. H.	
			5	—	8-10	—	8-10	—	—	418 E. H.	
			5	—	—	—	—	1-4	8-11	319 E. H.	

33. ARCHITECTURAL AND FREEHAND DRAWING.—Elements of architecture; walls, moldings, doors, windows, the Orders, vaults, roofs, stairs. Wash rendering, stereotomy, charcoal drawing from the cast. Lectures and sketching. *Nine hours drawing per week. I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	33	3	C	1-4	—	1-4	—	1-4	—	211 E. H.	—
			D	—	1-4	—	1-4	—	8-11	211 E. H.	—

34. DESIGN.—(Elementary). Rendered order problems and sketch problems involving simple composition; library research in elements of composition. *Nine hours drawing per week. II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	34	3	C	1-4	—	1-4	—	1-4	—	319 E. H.	—
			D	—	1-4	—	1-4	—	8-11	319 E. H.	—

43. WORKING DRAWINGS.—A course for Architectural Engineers, covering the growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; floors, walls, roofs, doors, windows, cornices, stairs, wainscoating, cabinet-work, interior finish; preparation of working drawings. *One recitation and three hours drawing per week. I; (2).*

Prerequisite: Architectural Engineering 31; General Engineering Drawing 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	43	2	C	—	1-4	—	1	—	—	422 E. H.	} Jones
										319 E. H.	
			D	1-4	—	1	—	—	—	319 E. H.	
										422 E. H.	

44. WORKING DRAWINGS.—A course for Architectural Engineers covering materials employed in stone masonry; their uses, defects, qualities, and modes of preparation; kinds of masonry and external finish; tools for stone cutting and their use; brick masonry, its materials and bonds; terra-cotta design, manufacture, and use; detailing of columns, beams, girders; joints and connections. Preparation of working drawings. *One recitation and three hours of drawing per week. II; (2).*

Prerequisite: Architectural Engineering 31, 43; General Engineering Drawing 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	44	2	C	—	1-4	—	—	—	—	319 E. H.	} Jones
				—	—	—	1	—	—	422 E. H.	
			D	1-4	—	—	—	—	—	319 E. H.	
				—	—	1	—	—	—	422 E. H.	

45. GRAPHIC STATICS.—Elements of Graphic Statics and application in designing trussed roofs. Forces, equilibrium, reactions, moments, bending moments, and shears on beams; center of gravity, moment of inertia, and kern of cross section. Stress diagrams of beams. *One recitation and six hours drawing per week. I; (3).*

Prerequisite: Architectural Engineering 43, 44; Theoretical and Applied Mechanics 20; Registration in Theoretical and Applied Mechanics 25.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	45	3	C	—	—	1-4	—	1-4	—	421 E. H.	}
				—	—	—	10	—	—	400 E. H.	
			D	—	10	—	—	—	—	400 E. H.	
				—	1-4	—	1-4	—	—	421 E. H.	

46. GRAPHIC STATICS.—A continuation of the first semester's work, showing by graphical representation the reactions, bending moments, shear, and deflection in beams. Design of wood and steel roofs; determination of section members; design of joints. *One lecture or recitation and six hours drawing per week. II; (3).*

Prerequisite: Architectural Engineering 43, 44, 45; Theoretical and Applied Mechanics 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	46	3	C	—	1-4	—	1-4	—	—	309 E. H.	—
				—	—	—	11	—	—	400 E. H.	—
			D	—	11	—	—	—	—	400 E. H.	—
				—	—	1-4	—	1-4	—	309 E. H.	—

47. ARCHITECTURAL ENGINEERING.—Advanced Graphic Statics applied to the analysis of metallic roofs of wide span; roof trusses of curved or unusual form and those supported by abutments and jointed, spherical, and conical trussed domes, the stone arch, vault, and dome, and of the Gothic system of vaults and buttresses; the strength of the walls, dams, retaining walls, and large chimneys; the effect of moving loads on girders. Problems in design for specified cases. *Two recitations and twelve hours drawing per week. I; (5).*

Prerequisite: Theoretical and Applied Mechanics 20, 25, 26; Architectural Engineering 43, 44, 45, 46.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	47	5	C	8-11	8-11	8-10	8-11	8-11	—	421 E. H.	Clark

48. STRUCTURES.—The design and detail of single and combined footings, of piles, brick, stone and concrete; construction and detail of mill and steel skeleton buildings; investigation of unusual types of framed structures, shop drawings. *Two recitations or lectures and twelve hours drawing per week. II; (5).*

Prerequisite: Architectural Engineering 47.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	48	5	C	8-10	1-4	8-11	1-4	8-10	—	421 E. H.	Clark

57. FIREPROOF CONSTRUCTION.—Figuring the strength of various types of construction using brick, terra-cotta, concrete, reinforced concrete and other types of fireproof materials. Investigations as to the advantages of each form of construction. *Two lectures or recitations per week. I; (2).*

Prerequisite: Theoretical and Applied Mechanics 20, 25, 26; Architectural Engineering 43, 44, 45, 46.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	57	2	C	—	11	—	11	—	—	422 E. H.	Provine

58. FIREPROOF CONSTRUCTION.—Continuation of first semester's work. Designing and detailing various types of fireproof construction; making complete working drawings for various types in use; investigation as to economy and advantages. *Two recitations or lectures and four hours of drawing per week. II; (2).*

Prerequisite: Theoretical and Applied Mechanics 20, 25, 26; Architectural Engineering 45, 46, 47.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	58	2	C	—	8-11	—	8-11	—	—	421 E. H.	Provine

ART AND DESIGN

EDWARD JOHN LAKE, B.S., *Assistant Professor*

CHARLES FABENS KELLEY, A.B., *Associate*

MARY MINERVA WETMORE, *Instructor*

CHARLES EARL BRADBURY, B.P., *Instructor*

I. FREEHAND DRAWING.—Practise drawing in charcoal and pencil; study of perspective principles with application in free-hand drawing; study of light, shadows, shade and reflections in monochrome; lectures and reference reading on graphical representation and the reproductive processes in printing. *I or II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	1	3	A	8,9	—	8,9	—	8,9	—	406 U H	Bradbury
			B	10,11	—	10,11	—	10,11	—	406 U H	Lake
			C	1,2	—	1,2	—	1,2	—	406 U H	Bradbury

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	1	3	A	8,9	—	8,9	—	8,9	—	406 U H	Lake

2. LIGHT AND SHADE.—Shaded drawing in monochrome in preparation for painting in oils and water-colors, with particular attention to values and composition. *II; (2).*

Prerequisite: Art and Design I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	2	2	—	10,11	—	10,11	—	10,11	—	406 U H	Bradbury

3. DRAWING FROM THE ANTIQUE.—Practise drawing from plaster models of anatomical forms in monochrome in preparation for painting the human figure; study of anatomical proportion and construction, with lectures on proportion, construction, composition, and action in the representation of the human figure for pictorial and decorative art. *I or II; (3).*

Prerequisite: Art and Design I.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	3	3	—	10,11	—	10,11	—	10,11	—	403 U H	Bradbury

4a-4b. WATER COLOR PAINTING.—Practise painting of still-life; flowers, and landscape, with application to pictorial and decorative art. *I, II; (3).*

Prerequisite: Art and Design 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	4a	3	—	1,2,3	—	1,2,3	—	1,2,3	—	407 U H	Wetmore

SECOND SEMESTER

Art and Design 4b 3 Schedule the same as for 4a (first semester).

5a-5b. DRAWING FROM LIFE.—Drawing in monochrome from life with application of the human figure to pictorial and decorative purpose. *I, II; (3).*

Prerequisite: Art and Design 1, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	5a	3	—	10,11	—	10,11	—	10,11	—	408 U H	Wetmore

SECOND SEMESTER

Art and Design 5b 3 Schedule the same as for 5a (first semester).

6a-6b. PORTRAIT IN OIL COLORS.—Painting in oil colors from costumed model, with especial attention to portrait and character study. *I, II; (3).*

Prerequisite: Art and Design 1, 3, 5a-5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	6a	3	—	10,11	—	10,11	—	10,11	—	408 U H	Wetmore

SECOND SEMESTER

Art and Design 6b 3 Schedule the same as for 6a (first semester).

7a-7b. STILL-LIFE IN OIL COLORS.—Practise painting of still-life; flowers and landscape in oil colors, with application to pictorial and decorative art. *I, II; (3).*

Prerequisite: Art and Design, 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	7a	3	—	1,2,3	—	1,2,3	—	1,2,3	—	408 U H	Wetmore

SECOND SEMESTER

Art and Design 7b 3 Schedule the same as for 7a (first semester).

8a-8b. MODELING.—Clay modeling of anatomical and decorative forms; the making of plaster molds and models; relative study of sculptural art. *I, II; (3).*

Prerequisite: Art and Design 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	8a	3	—	—	1,2,3	—	1,2,3	—	—	Basement Law Building	Lake

SECOND SEMESTER

Art and Design 8b

Schedule the same as for 8a (first semester).

10. SKETCHING.—Practise in pen, pencil; monochrome wash or charcoal rendering from landscape, still-life, and figure, with especial attention to the requirements for reproduction. *II; (1).*

Prerequisite: Art and Design 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	10	1	—	—	—	—	—	—	10,11	406 U H	Bradbury

11. PICTORIAL DESIGN.—A study of the composition and appreciation of pictures. Lectures with occasional reports. *I or II; (1).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	11	1	—	—	—	—	—	—	10,11	402 U H	Kelley

12. DESIGN.—The theory and practise of design; lectures on the theory of pure design and the effect of material upon execution; the fitness of different forms of media for different sorts of design; space division and space relations; the theory of color; color schemes and exercises; conventionalization of natural forms for various functions; practise in execution. *I or II; (2).*

Prerequisite: Art and Design 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	12	2	A, Lecture	10	—	—	—	—	—	410 U H	Kelley
			B, Lecture	10	—	—	—	—	—	410 U H	Kelley
			A, Conference	—	—	10	—	—	—	402 U H	Kelley
			B, Conference	—	—	—	—	10	—	402 U H	Kelley

SECOND SEMESTER

Art and Design	12	2	A, Lecture	10	—	—	—	—	—	410 U H	Kelley
			A, Conference	—	—	10	—	—	—	402 U H	Kelley

13. DESIGN.—Advanced. The design of objects in the styles of different periods, and supplementing the theory of pure design with practical problems; lectures and reading on the development of historic ornament. This course is directed toward giving the student a larger vocabulary for expressing himself through design. *I or II; (3).*

Prerequisite: Art and Design 1, 12.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	13	3	—	—	10,11	—	10,11	—	—	402 U H	Kelley

14. DESIGN.—Advanced Practise. Designs are executed upon a special field and in a medium selected by the student. An extended study is made of the chosen field of design. *I or II; (3).*

Prerequisite: Art and Design 1, 12, 13.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	14	3	—	—	—	—	—	—	—	402 U H	Kelley

(Arrange)

19. HISTORY OF THE FINE ARTS.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting previous to the Italian Renaissance. *I*; (2).

Prerequisite: One year of college work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	19	2	—	3	—	3	—	—	—	410 U. H.	Lake

20. HISTORY OF THE FINE ARTS.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting of the Italian Renaissance and to the present time. *II*; (2).

Prerequisite: One year of college work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	20	2	—	3	—	3	—	—	—	410 U. H.	Lake

ASTRONOMY

JOEL STEBBINS, Ph.D., *Professor*

FRANK WALKER REED, Ph.D., *Instructor*

ALEXANDER FELIX SAMUELS, A.B., *Research Assistant*

Students without mathematical training may elect course 1. Course 4 is for beginners, but requires a knowledge of trigonometry. Other courses should be taken in the order: 3, 6, 15, 14, 7, 8.

COURSES FOR UNDERGRADUATES

1. ELEMENTARY ASTRONOMY.—Lectures; recitations; one evening a week at the observatory. (For beginners; mathematics not required.) *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	1	3	—	11	—	11	—	11	—	228 N. H.	Stebbins

3. GENERAL ASTRONOMY FOR ENGINEERS.—Descriptive astronomy; required with course 6. *II*; (3).

Prerequisite: Mathematics 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	3	3	—	10	—	10	—	10	—	Observatory	Stebbins

4. GENERAL ASTRONOMY.—Lectures; recitations; two evenings a week at the observatory. *II*; (5.)

Prerequisite: Mathematics 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	4	5	—	9	9	9	9	9	—	103 Ch.	Reed

6. PRACTICAL ASTRONOMY.—Rough and accurate determinations of latitude, azimuth, and time, especially with the ordinary surveyor's transit; the art of computing. *II*; (2).

Prerequisite: Mathematics 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	6	2	—	—	10,11	—	10,11	—	—	Observatory	Stebbins

FOR ADVANCED UNDERGRADUATES AND GRADUATES

7-8. THEORETICAL ASTRONOMY.—Celestial mechanics; theory of orbits; perturbations; canonical transformations. *I, II*; (3).

Prerequisite: Mathematics 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	7	3	—							(Arrange)	Reed

SECOND SEMESTER

Astronomy	8	3	Schedule the same as for 7 (first semester).								
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9-10. CELESTIAL MECHANICS.—Properties of canonical systems of differential equations; integration by series; periodic and asymptotic solutions; integral invariants. *I, II*; (3).

Prerequisite: Mathematics 16; Astronomy 7-8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	9	3	—							(Arrange)	Reed

SECOND SEMESTER

Astronomy	10	3	Schedule the same as for 9 (first semester).								
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14. OBSERVATIONAL ASTRONOMY.—The working methods of an astronomical observatory; individual problems. *II*; (3).

Prerequisite: Astronomy 15.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	14	3	—							(Arrange)	Stebbins

15. GEODETIC ASTRONOMY.—The sextant, transit, and zenith telescope; methods similar to those of the United States Coast Survey. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	15	3	—							(Arrange)	Stebbins

COURSES FOR GRADUATES

101. SEMINAR AND THESIS.—*Three times a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	101	1 unit	—							(Arrange)	Stebbins

102. STELLAR ASTRONOMY.—Orbits of binary stars; variable stars; theoretical photometry. *Three times a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	102	1 unit	—							(Arrange)	Stebbins

BACTERIOLOGY

(See also BOTANY)

OTTO RAHN, Ph.D., *Assistant Professor*

JOEL ANDREW SPERRY, 2D, Ph.D., *Instructor*

LAWRENCE VREELAND BURTON, M.S., *Assistant*

COURSES FOR UNDERGRADUATES

5. INTRODUCTORY BACTERIOLOGY.—General morphology and physiology of bacteria and related microorganisms; technique of cultivation and observation. *I or II; (5).*

Prerequisite: Chemistry 3; junior standing.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	5	5	Lectures	10	—	10	—	—	—	503 Ag.	Rahn
			A, Quiz	11	—	11	—	—	—	303 Ag.	—
			B, Quiz	1	—	1	—	—	—	303 Ag.	Burton
			C, Quiz	—	9	—	9	—	—	303 Ag.	Sperry
			A, Laboratory	8,9	—	8,9	—	8,9	—	321 Ag.	Burton
			B, Laboratory	10,11	—	10,11	—	10,11	—	321 Ag.	Sperry, Burton
			C, Laboratory	—	1,2	—	1,2	1,2	—	321 Ag.	Sperry

6. BACTERIOLOGY FOR SANITARY ENGINEERS.—Routine methods for water analysis. *I; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	6	2	Lecture	1,2	—	—	—	—	—		
			Laboratory	—	—	2,3	—	—	—	323 Ag.	Rahn

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

8. APPLIED BACTERIOLOGY.—General course on the various applications of bacteriology; decay of organic matter in nature; soil and sewage bacteria; food bacteria; water bacteria; pathogenic bacteria. *II; (5).*

Prerequisite: Bacteriology 5; Chemistry 9, or the equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	8	5	Lecture	—	11	—	11	—	—	303 Ag.	Rahn
			Laboratory	0,11	—	10,11	—	10,11	—	323 Ag.	Burton

18a-18b. JOURNAL MEETING IN BACTERIOLOGY.—Required of all students specializing in bacteriology. *I, II; (1).*

Prerequisite: Bacteriology 5.

BOTANY

WILLIAM TRELEASE, D.Sc., LL.D., *Professor*
 THOMAS JONATHAN BURRILL, Ph.D., LL.D., *Professor, Emeritus*
 CHARLES FREDERICK HOTTES, Ph.D., *Professor*
 FRANK LINCOLN STEVENS, Ph.D., *Professor*
 OTTO RAHN, Ph.D., *Assistant Professor (Bacteriology)*
 STELLA MARY HAGUE, Ph.D., *Instructor*
 WALTER BYRON McDUGALL, Ph.D., *Instructor*
 JOEL ANDREW SPERRY, 2D, Ph.D., *Instructor (Bacteriology)*.
 ROSALIE MARY PARR, A.M., *Assistant*
 ERNEST MICHAEL RUDOLPH LAMKEY, A.B., *Assistant*
 LAWRENCE VREELAND BURTON, M.S., *Assistant (Bacteriology)*
 HARRY DWIGHT WAGGONER, A.B., *Assistant*
 NORA ELIZABETH DALBEY, A.M., *Assistant*
 FORREST ELLWOOD KEMPTON, M.S., *Assistant*
 BERT EDWIN QUICK, A.B., *Assistant*
 CYRUS WILLIAM LANTZ, A.M., *Assistant*
 WILLIAM EUGENE PICKLER, A.B., *Graduate Assistant*
 ROBERT LESLEY DAVIS, B.S., *Graduate Assistant*

Courses offered are of four types; the first intended to meet the needs of beginners; the second laying a foundation for methods of accuracy in observation, manipulation, and experimentation through the study of some fundamentally important subdivision of the science; the third giving practise in methods of investigation by the study of advanced problems varied to suit the needs and interests of the student; and the fourth teaching independent research by means of thesis subjects leading to the discovery of new facts or laws.

The work of any semester may be credited separately except when a problem is left incomplete in one of the courses open to graduates.

For the convenience of undergraduates in the College of Liberal Arts and Sciences who elect major work in botany the following combinations of courses are suggested:—(a) General; 2a, 3b, 4a, 14; (b) Specializing in morphology; 2a, 2b, 3a, 4a, 4b, or 4c; (c) Specializing in pathology; 2a or 3a, 7a, 7b, 16, 4a, or 17; (d) Specializing in physiology; 2b, 3a, 3b, 9a, or 9b; (e) Specializing in taxonomy; 2a, 4a or 4b or 4c, 14, 16 or 17. Students taking botany as a foundation for agronomy are advised to select courses 1, 3a, 3b, 4b, 7, and advanced work on some special topic or topics under courses 9, 15, or 17.

Candidates for the master's degree with botany as a major subject are expected to possess a general familiarity with the science as outlined in the collective courses offered primarily for undergraduates, in addition to doing more specialized graduate work.

Courses open for credit to graduates presuppose an earnest interest in the work and sufficient preliminary training to ensure initiative and intelligence in its prosecution under direction or, in the more advanced research courses, with general guidance and stimulative supervision only. Each such course includes weekly seminar conferences as an integral part of its plan, and a collective monthly conference brings together all students enrolled in this entire group of electives. Those who take such courses are advised to register also for course 20, the weekly meeting devoted to current literature in botany, which is obligatory for candidates for an advanced degree with botany as a major subject.

A. COURSES IN BOTANY.

FOR UNDERGRADUATES

I. GENERAL BOTANY.—A course of lectures outlining the structure, physiology, natural history and uses of plants, accompanied by reading with frequent quizzes and by laboratory work. The latter, like the reading, is adapted in different sections to the special needs and interests of students from the College of Liberal Arts and Sciences and the College of Agriculture. *When possible students are advised to precede it by elementary chemistry. I or II; (5).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	1	5	Lecture	—	9	—	9	—	—	228 N H	Trelease

(Primarily for Students in Agriculture)

A, Laboratory	10,11	—	10,11	—	10,11	—	216 N H	} McDougall and Assistants
B, Laboratory	1,2	—	1,2	—	1,2	—	216 N H	
A, Quiz	—	8	—	—	—	—		
B, Quiz	—	—	9	—	—	—		

(Primarily for Students in Liberal Arts and Sciences)

D, Laboratory	8,9	—	8,9	—	8,9	—	216 N H	} McDougall and Assistants
E, Laboratory	— 10,11	—	10,11	10,11	—	216 N H		
D, Quiz	—	—	—	10	—	—		
E, Quiz	—	8	—	—	—	—		
F, Quiz	—	—	—	—	1	—		

2a. MORPHOLOGY OF THALLOPHYTES.—A comparative laboratory study of types of the lower plants.

This and the following course are intended to give personal acquaintance with the vegetable kingdom through the study of living types selected so as to present in natural sequence the increasing complexity of structure and function which marks evolutionary development. *I; (5).*

Prerequisite: Botany I.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	2a	5	Lecture	—	2	—	2	—	—	229 N H	Hague
			Laboratory	1,2	1	1,2	1	1,2	—	304 N H	Hague

2b. MORPHOLOGY OF CORMOPHYTES.—A comparative laboratory study of selected types of the higher plants. *II; (5).*

Prerequisite: Botany I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	2b	5	Lecture	—	2	—	2	—	—	229 N H	Hague
			Laboratory	1,2	1	1,2	1	1,2	—	304 N H	Hague

3a. PLANT ANATOMY, HISTOLOGY AND TECHNIQUE.—Intended at once to lay the foundation of an exact knowledge of plant structure, especially of protoplasts and their parts and of the behavior and relations of the nucleus, and to teach the best methods of fixing, sectioning, staining and examining tissues, modeling from serial sections and photomicrography. *I; (5).*

Prerequisite: Botany I.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	3a	5	—	10,11	10,11	10,11	10,11	10,11	—	204 N H	Hottes

3b. PLANT PHYSIOLOGY.—A foundation course preparatory to advanced work in the science and in its applications to forestry and horticulture, and to crop judging and other phases of agronomy. *II*; (5).

Prerequisite: Botany I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	3b	5	—	10,11	10,11	10,11	10,11	10,11	—	204 N H	Hottes

4. THE LOCAL FLORA.—Morphology, ecology, identification, and classification of wild plants. A laboratory and field course for students desiring personal acquaintance with the plants of Illinois, and especially for those qualifying as teachers in the public schools. *I*; (3).

Prerequisite: Entrance botany or its equivalent, and sophomore standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4	3	—	8,9	—	8,9	—	8,9	—	304 N H	Hague

4a. TAXONOMY OF CORMOPHYTES.—Structure, identification and classification of higher plants. Laboratory and field work giving a comprehensive familiarity with flowering plants, but paying special attention to weeds, poisonous plants and the more commonly cultivated species. *II*; (5).

Prerequisite: Botany I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4a	5	—	10,11	10,11	10,11	10,11	10,11	—	305 N H	Trelease

4b. TAXONOMY OF ALGAE AND BRYOPHYTES.—Structure, identification, and classification. *II*; (5).

Prerequisite: Botany I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4b	5	—	10,11	10,11	10,11	10,11	10,11	—	304 N H	Hague

4c. TAXONOMY OF FUNGI.—Structure, identification, and classification. *II*; (5).

Prerequisite: Botany I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4c	5	—	10,11	10,11	10,11	10,11	10,11	—	Botany Annex	Stevens

4d. TREES AND SHRUBS OF THE CAMPUS.—A systematic study of the woody plants most used for decorative purposes. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4d	3	—	8,9	—	8,9	—	8,9	—	306 Ag.	Trelease

7a-7b. PLANT PATHOLOGY.—A general fundamental course to give knowledge of causal agents, symptoms, morbid histology, diagnosis, and treatment, and of the methods of study employed in plant pathology. *I, II; (5).*

Prerequisite: Botany 1; and 7a for the second semester.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	7a	5	—	8,9	8,9	8,9	8,9	8,9	—	Botany Annex	Stevens

SECOND SEMESTER

Botany 7b 5 Schedule the same as for 7a (first semester).

20. PLANT DISEASES.—An information course, for credit in the College of Agriculture only, consisting of lectures and laboratory work, intended to familiarize persons of ordinary training in observation with the most conspicuous diseases of commonly cultivated plants, special emphasis being laid on diagnosis and treatment. *I; (3).*

Prerequisite: Botany 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	20	3	—	1,2	—	1,2	—	1,2	—	Botany Annex	Stevens

FOR GRADUATES AND ADVANCED UNDERGRADUATES

9a-9b. PLANT ANATOMY OR PHYSIOLOGY.—Problems varied to meet the needs of persons intending to specialize either in anatomy with technique, or physiology, or in the application of these to medicine, plant breeding, crop production, forestry, etc. *I, II; *(3 or 5).*

Prerequisite: 10 hours of botany, including course 3a or 3b, and junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	9a	*3 or 5	Laboratory		10 hrs.	(arrange)				306 N H	Hottes

SECOND SEMESTER

Botany 9b *3 or 5 Schedule the same as for 9a (first semester).

14a-14b. HEREDITY, VARIATION, EVOLUTION.—A comparative study of the cells and of the members of plants, of their adaptations and changes, of the mechanism of heredity, and of the process of evolution. *I, II; (3).*

Prerequisite: 10 hours of botany, or 5 hours each of botany and zoology, and junior standing, and 14a for the second semester.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	14a	3	Lecture	—	11	—	11	—	—	229 N H	Hottes
			Laboratory		2 hrs.	(arrange)				306 N H	Hottes

SECOND SEMESTER

Botany 14b 3 Schedule the same as for 14a (first semester).

15a-15b. PLANT PATHOLOGY.—Special study may be made in the particular branch of pathology or group of pathogens which is of interest or use to the

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

student, as follows: 1. Special groups of causal agents as: rusts, smuts, powdery mildew, air, soil, water condition, etc.; 2. Special host groups as: orchard crops, timber crops, truck crops, ornamental crops, etc.; 3. Enzymes and toxins; 4. Physiological diseases; 5. Resistance and susceptibility; immunity; 6. The host reaction. *I, II*; *(3 or 5).

Prerequisite: 10 hours of botany, including 7a, and junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	15a	*3 or 5	Laboratory	6	or	10	hrs.	(arrange)		Botany Annex	Stevens

SECOND SEMESTER

Botany	15b	*3 or 5	Schedule the same as for 15a (first semester).								
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16a-16b. TAXONOMY AND ECOLOGY OF THALLOPHYTES.—Advanced practise on selected groups: (a), Algae and Bryophytes; (b) Fungi. *I, II*; *(3 or 5).

Prerequisite: 10 hours of botany, including either course 2a or 4a for Algae and Bryophytes, or 4b or 7a for Fungi, and junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	16a	*3 or 5	Laboratory	6	or	10	hrs.	(arrange)		a. 304 N H	Ilague
										b. Botany Annex	Stevens

SECOND SEMESTER

Botany	16b	*3 or 5	Schedule the same as for 16a (first semester).								
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17a-17b. TAXONOMY AND ECOLOGY OF CORMOPHYTES.—Advanced practise on selected taxonomic, ecological or economic groups. Specialized studies, as of genera or families of Illinois plants, ecological association or adaptations, or plants economically important as weeds, forest resources, adjuncts to medicine, farm, orchard or garden crops, or as the basis of floriculture, landscape architecture, street shading or other decorative planting. *I, II*; *(3 or 5).

Prerequisite: 10 hours of botany, including course 4 or 4a, and junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	17a	*3 or 5	Laboratory	6	or	10	hrs.	(arrange)		304 N H	Trelease

SECOND SEMESTER

Botany	17b	*3 or 5	Schedule the same as for 17a (first semester).								
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10a-10b. CURRENT BOTANICAL LITERATURE.—A weekly review covering the field of botany; supplementary to the various seminar conferences. *I, II*; (1).

Prerequisite: Concurrent taking of some course in botany open for graduate credit.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	10a	1	—	—	—	—	—	4	—	229 N H	Trelease
											Hottes
											Stevens
											Hague

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

SECOND SEMESTER

Botany 10b 1 Schedule same as for 10a (first semester).

COURSES FOR GRADUATES

The work here outlined is open only to those who have had liberal botanical training including at least one year of successful study in the particular line in which it is desired further to specialize. These courses may be elected for minor or for major work.

101. CYTOLOGY.—The influence of external agents on the cell. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	101	1 or 2 units	—							(Arrange)	Hottes

102. PHYSIOLOGY.—The effects of external stimuli on growth and movement. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	102	1 or 2 units	—							(Arrange)	Hottes

104. MYCOLOGY.—Field and laboratory investigations upon selected groups of fungi. Individual assignments of subjects and problems. *I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	104	1 or 2 units	—							(Arrange)	Stevens

106. PLANT PATHOLOGY.—Diseases of plants, and disease agents. Special subjects are assigned upon consultation. *I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	106	1 or 2 units	—							(Arrange)	Stevens

108. TAXONOMY.—Monographic studies of critical groups. *I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	108	1 or 2 units	—							(Arrange)	Trelease

B. BACTERIOLOGY

(SEE COURSES LISTED SEPARATELY)

CERAMICS

RAY THOMAS STULL, E.M., *Acting Director*
 RALPH KENT HURSH, B.S., *Instructor*
 BARNEY S. RADCLIFFE, M.S., *Instructor*
 ARTHUR EDWARDS WILLIAMS, B.S., *Assistant*
 RALPH RAYMOND DANIELSON, B.S., *Assistant*

The courses offered by the department of ceramics are designed to give a technical knowledge of the composition and properties of materials used in the manufacture of clay wares, cements, enamels, and glasses, and of the physical and chemical changes which they undergo during manufacture; and to acquaint the student with machinery, application of power, and the construction and operation of plants. Advanced students are permitted to take part in these investigations carried on under direction of the instructors. Seniors and graduate students are expected to conduct investigations of their own in some line of work in which they are especially interested.

1. CERAMIC MATERIALS.—The properties of clays and other ceramic materials; the identification of the varieties met in practical work. Lectures; laboratory. II; (3).

Prerequisite: Chemistry 2, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	1	3	A, Lecture	10	—	10	—	—	—	203 Cer.	Hursh
			B, Lecture	10	—	10	—	—	—	102 Cer.	Williams
			A, Laboratory	1,2,3	—	—	—	—	—	101 Cer.	Hursh
			B, Laboratory	—	—	—	—	1,2,3	—	101 Cer.	Williams

2. WINNING AND PREPARATION OF CLAYS.—Methods, machinery, and costs. I; (3).

Prerequisite: Chemistry 5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	2	3	—	—	10	—	10	—	10	204 Cer.	Radcliffe

3. INDUSTRIAL CALCULATIONS.—Chemical and physical calculations applying to the operation of furnaces, kilns, and dryers; temperature measurements; ceramic stoichiometry. I; (3).

Prerequisite: Mathematics 8; Chemistry 5b; Physics 1a-1b and 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	3	3	A	10	—	10	—	10	—	204 Cer.	Hursh
			B	11	—	11	—	11	—	204 Cer.	Williams

4. DRYING AND BURNING.—Methods of drying and burning clay wares; types of construction of industrial dryers and kiln plants; chemical and physical processes involved. I; (4).

Prerequisite: Ceramics I, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	4	4	—	9	9	9	9	—	—	203 Cer.	Stull

5. CERAMIC BODIES.—Composition of ceramic bodies; physical and chemical changes produced by the blending of various clays with other ceramic materials; methods of shaping the various products. Lectures; Laboratory. *II*; (5).

Prerequisite: Ceramics 3.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Ceramics	5	5	Lecture	10	—	10	—	10	—	203 Cer.	Radcliffe
			Laboratory	—	2,3,4	—	2,3,4	—	—	102 Cer.	Radcliffe

6. GLAZES.—Production of glazes and enamels; limits of composition; classification; properties and defects common to each class; effect of variation in composition; modes of application. Lectures; laboratory. *I*; (5).

Prerequisite: Ceramics 3, 5; registration in Ceramics 4.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	6	5	Lecture	1	—	1	—	—	—	203 Cer.	Stull
			Laboratory	2,3,4	—	2,3,4	—	2,3,4	—	102 Cer.	Danielson

8. GLASS.—Raw materials, preparation, compounding, melting, and shaping of glass; chemical principles involved in the manufacture and decoration of the various types of vitreous silicates. Lectures. *II*; (2).

Prerequisite: Ceramics 3, 6.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	8	2	—	—	9	—	9	—	—	203 Cer.	Stull

9. CERAMIC CONSTRUCTION.—Plans, specifications, and estimates for ceramic equipments and industrial plants. *II*; (4).

Prerequisite: G. E. D. 2; Ceramics 3, 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	9	4	—	1,2,3	1,2,3	1,2,3	1,2,3	—	—	206 Cer.	} Stull Hursh

10. CEMENTS.—Cements, limes, plasters; composition; reactions; methods of manufacture and testing. *I*; (3).

Prerequisite: Ceramics 3.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	10	3	—	—	10	—	10	—	10	203 Cer.	Hursh

II. THESIS.—*II*; (5).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	11	5	—							(Arrange)	Stull Hursh

12. DESIGNING AND SHAPING.—Technical designing and shaping from the standpoint of the manufacturer; die construction; templates; master and working molds for pressing, casting, and jiggering. *II*; (3).

Prerequisite: Ceramics I.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	12	3	Lecture	—	—	—	—	2	—	203 Cer.	Radcliffe
			Laboratory	2,3,4	—	2,3,4	—	—	—	108 Cer.	Radcliffe

15. GLASS LABORATORY.—Soda-lime, potash-lime, lead, barium, and zinc silicates; boro-silicates; properties of fused and solidified glasses; practical glass problems. *I*; (3).

Prerequisite: Ceramics 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	15	3	—							(Arrange)	Stull

16. GLASSES AND ENAMELS.—Continuation of Ceramics 15. Opaque, colored, and optical glasses; enameling of metals. *II*; (3).

Prerequisite: Ceramics 15.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	16	3	—							(Arrange)	Stull

17. SILICATES.—Formation and properties of silicates; experimental methods. *II*; (3).

Prerequisite: Ceramics 1, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ceramics	17	3	Lecture	—	10	—	10	—	—	203 Cer.	Hursh
			Laboratory	—	—	—	—	2,3,4	—	103 Cer.	Danielson

CHEMISTRY

WILLIAM ALBERT NOYES, Ph.D., LL.D., *Professor and Director*

SAMUEL WILSON PARR, M.S., *Professor*

HARRY SANDS GRINDLEY, D.Sc., *Professor*

EDWARD BARTOW, Ph.D., *Professor*

CLARENCE WILLIAM BALKE, Ph.D., *Professor*

EDWARD WIGHT WASHBURN, Ph.D., *Professor*

DAVID FORD MCFARLAND, Ph.D., *Assistant Professor*

GEORGE MCPHAIL SMITH, Ph.D., *Assistant Professor*

CLARENCE GEORGE DERICK, Ph.D., *Assistant Professor*

HENRY CHARLES PAUL WEBER, Ph.D., *Assistant Professor*

DUNCAN ARTHUR MACINNES, Ph.D., *Associate*

GEORGE DENTON BEAL, Ph.D., *Associate*

B. SMITH HOPKINS, Ph.D., *Associate*

LAMBERT THORP, Ph.D., *Instructor*

CHARLES GEORGE MACARTHUR, A.M., *Instructor*

HENRY JOHN BRODERSON, Ph.D., *Instructor*

CHARLES HENRY HECKER, Ph.D., *Instructor*

GEORGE WALLACE SEARS, Ph.D., *Instructor*

HUBERT LEONARD OLIN, Ph.D., *Instructor*

EDWARD OTTO HEUSE, Ph.D., *Instructor*

JESSIE YEOREANCE CANN, Ph.D., *Instructor*

BRONISLAV ROMAN HONOVSKI, Ph.D., *Research Assistant*

HARRY PEACH CORSON, M.S., *Assistant*

OLIVER KAMM, M.S., *Assistant*

BERT STOVER DAVISSON, A.B., *Assistant*

EDGAR WALLACE ENGLE, M.S., *Assistant*
JOHN WILLIAM READ, M.S., *Assistant*
ERNEST ATKINS WILDMAN, M.S., *Assistant*
RAYMOND WASHINGTON HESS, A.B., *Assistant*
SCOTT CHAMPLIN TAYLOR, B.S., *Assistant*
EDWARD WICHES, A.B., *Assistant*
THEODORE RALLY BALL, M.S., *Assistant*
HOWARD DEWITT VALENTINE, B.S., *Assistant*
HARRY CLEVELAND KREMMERS, A.B., *Assistant*
HENRY JOSEPH WEILAND, B.S., *Assistant*
JUANITA ELIZABETH DARRAH, A.B., *Assistant*
WILLIAM ASBURY MANUEL, A.B., *Assistant*
ERNEST EDWARD CHARLTON, A.B., *Assistant*
EDWIN ARTHUR REES, A.M., *Assistant*
PAUL ANDERS, *Assistant, Glass Blowing*
STEWART DENT MARQUIS, A.B., *Graduate Assistant*
EVERETT HARVEY TAYLOR, A.B., *Graduate Assistant*
RALPH WALDO TIPPET, A.B., *Graduate Assistant*
HENRY LESTER GERRY, A.M., *Graduate Assistant*
GLENN SEYMOUR SKINNER, A.B., *Graduate Assistant*
SILAS ALONZO BRALEY, A.B., *Graduate Assistant*
JAY THOMAS FORD, A.B., *Graduate Assistant*
AXEL MAGNUS HJORT, A.B., *Graduate Assistant*
TERRENCE ONAS WESTHAFFER, A.B., *Graduate Assistant*
ALBERT DURAND SHEPARD, B.S., *Graduate Assistant*
REUBEN WINFIELD ALLEN, M.S., *Graduate Assistant*
CARL NATHAN DAVIDSON, A.B., *Graduate Assistant*
DON WARREN BISSEL, B.S., *Graduate Assistant*
PAUL MARSHALL DEAN, A.M., *Graduate Assistant*
CLARENCE BARBRE, B.S., *Graduate Assistant*
JAMES BURLEIGH LUCAS, M.S., *Graduate Assistant*
EDGAR WAYNE FIELDING, A.B., *Graduate Assistant*
PAUL COBB RICH, B.S., *Graduate Assistant*
WALTER GERALD KARR, B.S., *Graduate Assistant*

Students taking chemistry at the University are advised to give at least one year to the subject, and this should include Chemistry 1 or 1a, 2, and 3. Those continuing in the second year should take Chemistry 5a and 5b, 5c or 13a. In the third year Chemistry 14 or 9, 9a, and 9b, or 9c, 31, and 33 should be taken. With these, more special courses may be taken if desired, but, in general, students are not advised to take the special courses unless they have had the fundamental work represented by the selection given above. Students who desire a training for professional work in chemistry, either as teachers or in its industrial applications, will naturally take the chemical course or the course in chemical engineering.

Students who find it impossible to take more than one semester's work are requested to register for Chemistry 1 or 1a in the second semester rather than in the first.

A major in chemistry shall consist of twenty hours in chemistry, exclusive of the first semester's work, and shall include courses in quantitative analysis and organic chemistry.

Students who major in chemistry may offer a minor made up of approved courses from the following departments: Botany, Ceramics, Geology, Household Science, Mathematics, Physics, Physiology, Zoology.

I. INORGANIC CHEMISTRY.—The non-metallic elements. Noyes's *Text-book of Chemistry. I or II*; (5).

Professor BALKE in charge.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1	5	A, Lecture	—	11	—	11	—	—	100 Ch.	Noyes
			B, Lecture	—	9	—	9	—	—	100 Ch.	Balke
			C, Lecture	—	2	—	2	—	—	100 Ch.	Balke
			A, Quiz	8	—	8	—	—	—	Rooms to be posted at begin- ning of semester	Balke, Hopkins, Hecker, Sears, Cann, and Assistants
			B, Quiz	11	—	11	—	—	—		
			C, Quiz	—	8	—	8	—	—		
			D, Quiz	—	10	—	10	—	—		
			E, Quiz	—	1	—	1	—	—		
			F, Quiz	—	3	—	3	—	—		
			A, Laboratory	8,9	—	8,9	—	8,9	—		
			B, Laboratory	10,11	—	10,11	—	10,11	—		
			C, Laboratory	—	10,11	—	10,11	—	10,11		
			D, Laboratory	1,2	—	1,2	—	1,2	—		

SECOND SEMESTER

	Lecture	—	11	—	11	—	—				
A, Quiz	—	8	—	8	—	—	—	*			
B, Quiz	—	10	—	10	—	—	—	*			
A, Laboratory	8,9	—	8,9	—	8,9	—	—	*			
B, Laboratory	1,2	—	1,2	—	1,2	—	—	*			

*Rooms to be posted at beginning of semester.

1a. INORGANIC CHEMISTRY.—Lectures; recitations; laboratory. *I or II*; (4).
Professor BALKE in charge.

Prerequisite: One year of entrance chemistry.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1a	4	A, Lecture	—	11	—	11	—	—	100 Ch.	Noyes
			B, Lecture	—	9	—	9	—	—	100 Ch.	Balke
			C, Lecture	—	2	—	2	—	—	100 Ch.	Balke
			G, Quiz	9	—	9	—	—	—	Rooms to be posted at begin- ning of semester	Balke, Hopkins, Hecker, Sears, Cann
			H, Quiz	10	—	—	—	10	—		
			I, Quiz	11	—	—	—	11	—		
			J, Quiz	—	8	—	8	—	—		
			K, Quiz	—	9	—	9	—	—		
			L, Quiz	—	10	—	10	—	—		
			M, Quiz	—	1	—	1	—	—		
			N, Quiz	—	3	—	3	—	—		
			O, Quiz	—	—	8	—	8	—		
			P, Quiz	—	—	1	—	1	—		
			G, Laboratory	8,9,10	—	—	—	—	—		
			H, Laboratory	—	8,9,10	—	—	—	—		
			I, Laboratory	—	—	—	8,9,10	—	—		
			J, Laboratory	—	—	—	—	8,9,10	—		
			K, Laboratory	—	—	—	—	—	8,9,10		
			L, Laboratory	1,2,3	—	—	—	—	—		
			M, Laboratory	—	1,2,3	—	—	—	—		
			N, Laboratory	—	—	1,2,3	—	—	—		
			O, Laboratory	—	—	—	1,2,3	—	—		
			P, Laboratory	—	—	—	—	1,2,3	—		

SECOND SEMESTER

Lecture	—	11	—	11	—	—	Rooms	Balke, Hopkins, Hecker, Sears, Cann
E, Quiz	10	—	10	—	—	—	to be	
F, Quiz	11	—	11	—	—	—	posted	
G, Quiz	—	10	10	—	—	—	at	
E, Laboratory	—	8,9,10	—	—	—	—	begin-	
F, Laboratory	—	—	—	—	—	8,9,10	ning	
G, Laboratory	1,2,3	—	—	—	—	—	or	
H, Laboratory	—	—	1,2,3	—	—	—	semester	

1b. INORGANIC CHEMISTRY.—Inorganic chemistry. Lectures; recitations; laboratory. (For students in engineering.) *I or II*; (4).

Professor BALKE in charge.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1b	4	A, Lecture	—	11	—	11	—	—	100 Ch.	Noyes
			B, Lecture	—	9	—	9	—	—	100 Ch.	Balke
			C, Lecture	—	2	—	2	—	—	100 Ch.	Balke
			Q, Quiz	9	—	9	—	—	—	Rooms to be posted at begin- ning of semester	Balke, Hopkins, Hecker, Sears, Cann
			R, Quiz	10	—	—	—	10	—		
			S, Quiz	11	—	—	—	11	—		
			T, Quiz	—	9	—	9	—	—		
			U, Quiz	—	—	8	—	8	—		
			V, Quiz	—	—	1	—	1	—		
			Q, Laboratory	8,9,10	—	—	—	—	—		
			R, Laboratory	—	8,9,10	—	—	—	—		
			S, Laboratory	—	—	—	8,9,10	—	—		
			T, Laboratory	—	—	—	—	8,9,10	—		
			U, Laboratory	—	—	—	—	—	8,9,10		
			V, Laboratory	1,2,3	—	—	—	—	—		
			W, Laboratory	—	1,2,3	—	—	—	—		
			X, Laboratory	—	—	1,2,3	—	—	—		
			Y, Laboratory	—	—	—	1,2,3	—	—		
			Z, Laboratory	—	—	—	—	1,2,3	—		

SECOND SEMESTER

Lecture	—	11	—	11	—	—	100 Ch.	Balke
L, Quiz	10	—	10	—	—	—	Rooms	Balke Hopkins Sears
M, Quiz	11	—	11	—	—	—	to be	
N, Quiz	—	10	—	10	—	—	posted	
L, Laboratory	—	8,9,10	—	—	—	—	at	
M, Laboratory	1,2,3	—	—	—	—	—	begin-	
N, Laboratory	—	—	1,2,3	—	—	—	ning	
							of semester	

2. INORGANIC CHEMISTRY.—A continuation of Chemistry 1. The metallic elements; their classification, compounds, and chemical properties. Lectures; assigned text. Noyes's *Textbook of Chemistry*. *I or II*; (2).

Professor BALKE in charge.

Prerequisite: Chemistry 1; registration in Chemistry 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	2	2	Lecture	—	—	9	—	—	—	100 Ch.	Balke
			Quiz	8	—	—	—	8	—		(Arrange)

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	2	2	A, Lecture	—	10	—	10	—	—	100 Ch.	Noyes
			B, Lecture	—	9	—	9	—	—	100 Ch.	Balke
			A, Quiz	9	—	9	—	—	—	Rooms	Balke Hopkins Hecker Sears Cann
			B, Quiz	10	—	10	—	—	—	to be	
			C, Quiz	—	9	—	9	—	—	posted	
			D, Quiz	—	11	—	10	—	—	at	
			E, Quiz	—	1	—	1	—	—	begin-	
			F, Quiz	—	—	8	—	8	—	ning	
			G, Quiz	—	—	11	—	11	—	of	
			H, Quiz	—	—	1	—	1	—	semester	

3. QUALITATIVE ANALYSIS.—Recitations; laboratory. *I* or *II*; (3).

Assistant Professor WEBER in charge.

Prerequisite: Chemistry 1; registration in Chemistry 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	3	3	Lecture	—	—	—	—	9	—	100 Ch.	Weber
			Quiz	8	—	—	—	—	—	}	(Arrange)
			Laboratory	—	8,9	—	8,9	—	8,9		

SECOND SEMESTER

A, Lecture	—	—	—	10	—	—	100 Ch.	Weber
B, Lecture	—	—	—	9	—	—	100 Ch.	Weber
A, Quiz	8	—	—	—	—	—	}	(Arrange)
B, Quiz	9	—	—	—	—	—		
C, Quiz	11	—	—	—	—	—		
D, Quiz	1	—	—	—	—	—		
E, Quiz	—	2	—	—	—	—		
F, Quiz	—	—	9	—	—	—		
G, Quiz	—	—	—	3	—	—		
H, Quiz	—	—	—	—	9	—		
I, Quiz	—	—	—	—	10	—		
A, Laboratory	8,9	—	8,9	—	8,9	—		
B, Laboratory	—	8,9	—	8,9	—	8,9	}	(Arrange)
C, Laboratory	10,11	—	10,11	—	10,11	—		
D, Laboratory	1,2	—	1,2	—	1,2	—		
E, Laboratory	—	1,2	—	1,2	—	10,12		

4. QUALITATIVE ANALYSIS AND CHEMISTRY OF THE METALLIC ELEMENTS.—Class and laboratory work. (For students in engineering.) *I*; (4).

Prerequisite: Chemistry 1a or 1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	4	4	A, Quiz	9	—	9	—	—	—	319 Ch.	Weber
			B, Quiz	11	—	11	—	—	—	}	(Arrange)
			C, Quiz	—	11	—	11	—	—		
			A, Laboratory	1,2,3	—	—	1,2,3	—	—		
			B, Laboratory	—	1,2,3	1,2,3	—	—	—		
			C, Laboratory	—	—	—	—	1,2,3	8,9,10		

SECOND SEMESTER

A, Quiz	9	—	9	—	—	—	}	(Arrange)
B, Quiz	11	—	11	—	—	—		
C, Quiz	—	9	—	9	—	—		
D, Quiz	—	11	—	11	—	—		
A, Laboratory	8,9	—	8,9	—	8,9	—		
B, Laboratory	—	8,9	—	8,9	—	8,9		
C, Laboratory	1,2,3	—	—	—	1,2,3	—		
D, Laboratory	—	1,2,3	—	1,2,3	—	—		

5a. ELEMENTARY QUANTITATIVE ANALYSIS.—Gravimetric and volumetric analysis; stoichiometrical relations and the application of the fundamental laws of chemistry to quantitative analysis. Lectures; recitations; laboratory. Talbot's *Quantitative Chemical Analysis*. (Medical students are given special problems in the latter part of the course.) *I or II*; (5).

Assistant Professor SMITH in charge.

Prerequisite: Chemistry 2, 3.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5a	5	Lecture	—	9	—	9	—	—	217 Ch.	Smith
			A, Laboratory	—	1,2,3	—	1,2,3	—	8-12	218 Ch.	Smith
			B, Laboratory	1,2,3	—	1,2,3	—	1,2,3	—	218 Ch.	Smith
SECOND SEMESTER											
Chemistry	5a	5	Lecture	—	9	—	9	—	—	217 Ch.	Olin
			Laboratory	—	1,2,3	—	1,2,3	—	8-12	216 Ch.	Olin

5b. QUANTITATIVE ANALYSIS.—Continuation of 5a. Methods; the analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; laboratory. Treadwell-Hall: *Analytical Chemistry*, Vol. II. *II*; (5).

Prerequisite: Chemistry 5a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5b	5	Lecture	—	9	—	9	—	—	217 Ch.	Smith
			Laboratory	—	1,2,3	—	1,2,3	—	8-12	218 Ch.	Smith

5c. FOOD ANALYSIS.—Quantitative organic analysis, with special reference to the examination of food and drug products: alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives, and colors. Sherman's *Organic Analysis*; "Bulletin 107, rev., U. S. Bureau of Chemistry." *II*; *(3 to 5).

Prerequisite: Chemistry 5a or 13a; 9 or 14a-14b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5c	*3 to 5	Lecture	—	10	—	10	—	—	111 Ch.	Beal
			Laboratory	1,2,3	—	1,2,3	—	1,2,3	—	216 Ch.	Beal

6†. CHEMICAL TECHNOLOGY.—Technological chemistry as illustrated in those industries having a chemical basis for their principal operations and processes; trade journals. Lectures; recitations. Rogers and Aubert's *Industrial Chemistry*. *II*; (2).

Prerequisite: Chemistry 5a and 14a-14b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	6	2	—	—	11	—	11	—	—	111 Ch.	McFarland

7†. METALLURGY.—General metallurgy; metallurgy of iron and steel; metallurgy of the non-ferrous metals. Lectures; assigned reading; recitations. Fulton's *Principles of Metallurgy*; Stoughton's *Iron and Steel*. *I*; (3).

Prerequisite: Chemistry 5a.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

†Certain inspection trips will be arranged in connection with courses 6 and 7. Students registered in these courses should take into consideration the expense involved, which will approximate \$15.00 for each course.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	7	3	—	11	—	11	—	11	—	111 Ch.	McFarland

[8. IRON AND STEEL ANALYSIS.—Analyses of all the constituents by both rapid, or technical, and standard methods. *II*; (3).

Not given 1914-15.

Prerequisite: Chemistry 5b.]

9. ORGANIC CHEMISTRY.—The characteristics of the more typical and simple organic compounds; the important classes of derivatives of carbon. (For students of the medical preparatory and household science courses and others desiring a short course.) *II*; (3).

Prerequisite: Chemistry 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9	3	—	8	—	8	—	8	—	217 Ch.	Derick

9a. ORGANIC SYNTHESIS AND ULTIMATE ANALYSIS.—Ultimate organic analysis; preparation of typical organic compounds. Laboratory. *I or II*; (2).

Prerequisite: Registration in Chemistry 14a-14b, or equivalent.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9a	2	A	1,2,3	—	1,2,3	—	—	—	219 Ch.	Derick, Thorpe
			B	—	1,2,3	—	1,2,3	—	—	219 Ch.	Derick, Thorpe

9b. ORGANIC SYNTHESIS AND QUALITATIVE ORGANIC ANALYSIS.—Continuation of 9a, to accompany Chemistry 14. *I or II*; (2).

Prerequisite: Chemistry 9a; registration in Chemistry 14a-14b, or equivalent.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9b	2	—	1,2,3	—	1,2,3	—	—	—	219 Ch.	Derick, Thorpe

9c. ORGANIC SYNTHESIS.—Typical organic compounds. Laboratory. (For students in the medical preparatory and household science courses and others desiring a brief course.) *II*; (2).

Prerequisite: Chemistry 3; registration in Chemistry 9, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9c	2	—	—	1,2,3	—	1,2,3	—	—	219 Ch.	Derick, Thorpe

10a. WATER CHEMISTRY.—The history, sources, contamination, and standards of purity of potable waters and waters for industrial purposes. Lectures; practise in analytical methods. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	10a	3	—	1,2,3	—	1,2,3	—	1,2,3	—	116 Ch.	Bartow, Corson

10b. (A modification of 10a to meet the requirements of students in sanitary engineering, registered in connection with Chemistry 2 and 3.) *II*; (2½).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	10b	2½	—	1,2,3	—	1,2,3	—	—	—	116 Ch.	Bartow, Corson

11a-11b. RESEARCH.—Thesis embodying a thoro review of the literature of the subject; account of work done in the laboratory. The subject should be determined upon and reading begun in the junior year. A minimum of five semester hours is required. (Required for seniors.) *I, II*; (5).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	11a	5	—							(Arrange)	Noyes in charge

SECOND SEMESTER

Chemistry	11b	5	—							(Arrange)	Noyes in charge
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13a. AGRICULTURAL ANALYSIS.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Talbot's *Quantitative Chemical Analysis*. (For students in agriculture.) *I or II*; (5).

Assistant Professor SMITH in charge.

Prerequisite: Chemistry 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	13a	5	Lecture	—	—	11	—	—	—	100 Ch.	Beal
			A, Lab. & Quiz	8,9,10	—	8,9,10	—	8,9,10	—	218 Ch.	Beal, Olin
			B, Lab. & Quiz	—	8-12	—	8,12	—	8	218 Ch.	Beal, Olin
			C, Lab. & Quiz	—	1,2,3	—	1,2,3	—	8,9,10	218 Ch.	Beal, Olin

SECOND SEMESTER

Chemistry	13a	5	Lecture	—	—	11	—	—	—	100 Ch.	Olin
			A, Lab. & Quiz	8,9,10	—	8,9,10	—	8,9,10	—	218 Ch.	Beal, Olin
			B, Lab. & Quiz	—	8-12	—	8,12	—	8	218 Ch.	Beal, Olin
			C, Lab. & Quiz	1,2,3	—	1,2,3	—	1,2,3	—	218 Ch.	Beal, Olin

13b. ADVANCED AGRICULTURAL ANALYSIS.—Applied quantitative analysis. The analysis of fungicides, limestone, phosphate rock, fuel, and water; determination of the alkali metals; special methods of agricultural analysis. Treadwell-Hall, *Analytical Chemistry*, Vol. II. (For students who wish to specialize in agricultural chemistry or agricultural experiments.) *II*; (5).

Prerequisite: Chemistry 5a or 13a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	13b	5	Lecture	1	—	1	—	—	—	103 Ch.	Beal
			Laboratory	2,3	—	2,3	—	1,2,3	—	216 Ch.	Beal

14a-14b. ORGANIC CHEMISTRY.—Lectures; recitations. Noyes's *Organic Chemistry*. I, II; (3).

Prerequisite: Chemistry 5a; should be accompanied by Chemistry 9a and 9b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	14a	3	—	11	—	11	—	11	—	217 Ch.	Noyes

SECOND SEMESTER

Chemistry	14b	3	Schedule the same as for 14a (first semester).								
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15. PHYSIOLOGICAL CHEMISTRY.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic-digestion; intestinal digestion; bile; putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these topics treated thoroly for the prospective students of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Hammarsten's *Text Book of Physiological Chemistry*; Hawk's *Practical Physiological Chemistry*. (Open to graduates and undergraduates.) I; *(5 or 7).

Prerequisite: Two years' work in chemistry.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15	*5 or 7	Lecture	2	—	2	—	—	—	217 Ch.	MacArthur
			Laboratory	—	1,2,3	—	1,2,3	1,2,3	—	219 Ch.	—

15a. PROBLEMS OF PHYSIOLOGICAL CHEMISTRY.—Colloids; animal oxidations; osmosis; absorption; selective activity of cells; metabolism; activities of gastrointestinal tract; enzymes; inorganic nutrition. Lectures; demonstrations; conferences. II; (2).

Prerequisite: Chemistry 15.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15a	2	—	9	—	—	—	—	9	217 Ch.	MacArthur

16. CHEMISTRY FOR ENGINEERS.—The proximate analysis of coal; determination of calorific power; technical analysis of furnace gases; examination of boiler waters; lubricating oils. (For mechanical engineers.) II; (3).

Prerequisite: Chemistry I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	16	3	Lecture	—	—	—	—	8	—	111 Ch.	Parr
			A, B, Laboratory	—	1,2,3	—	1,2,3	—	—	—	Broderson
			C, Laboratory	—	—	—	8,9,10	—	8,9,10	—	—

17. TEACHERS' COURSE.—The methods of teaching elementary chemistry. I; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	17	1	—					(Arrange)		321 Ch.	Balke

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

21. QUALITATIVE ORGANIC ANALYSIS.—Systematic methods for identification of pure organic compounds and mixtures. *I or II*; (2).

Prerequisite: Chemistry 9a, 9b.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	21	2	A	—	1,2,3	—	1,2,3	—	—	219 Ch.	Derick, Kamm
			B	1,2,3	—	1,2,3	—	—	—	219 Ch.	Derick, Kamm

22. ANIMAL CHEMISTRY (ANIMAL NUTRITION).—The chemical composition of animal products and feeding stuffs. Lectures; conferences; assigned reading; laboratory. *I or II*; (5).

Prerequisite: Two years' work in chemistry.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	22	5	—					(Arrange)		558 Ag.	Grindley

27. QUALITATIVE ANALYSIS OF THE RARE ELEMENTS.—The rare elements and their compounds; identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Assigned reading; laboratory. *II*; (3).

Prerequisite: Two years' work in chemistry.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	27	3	—					(Arrange)		321 Ch.	Balke

31. ELEMENTARY PHYSICAL CHEMISTRY.—Some of the more important principles and methods of physical chemistry and electro-chemistry; numerous problems. Lectures; recitations. *II*; (3).

Prerequisite: Chemistry 1, 2, 3; Physics 1a-1b or 7a-7b; Mathematics 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	31	3	—	10	—	10	—	10	—	111 Ch.	Washburn

33. ELEMENTARY PHYSICAL CHEMISTRY.—Molecular weight of gases and solutions; chemical equilibrium; the electrical conductivity of solutions and the attendant phenomena within the solution; thermochemistry. (Laboratory to accompany course 31.) *II*; (2).

Prerequisite: Chemistry 5a; Physics 8a-8b or 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	33	2	A, Conference	—	8	—	8	—	—	(Arrange)	MacInnes
			B, Conference	—	9	—	9	—	—		—
			A, Laboratory	—	1-4	—	1-4	—	—		—
			B, Laboratory	—	—	1-4	—	1-4	—		—

35. ELECTROCHEMISTRY.—(A continuation of Chemistry 31. See also Chemistry 102b.) Theory and applications. Lectures, recitations, laboratory. Allmand's *Applied Electrochemistry*. *I*; (3).

Prerequisite: Chemistry 31, 33.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	35	3	Lecture	—	11	—	—	—	—	114 Ch.	MacInnes
			Laboratory	1,2,3	—	1,2,3	—	—	—	128 Ch.	MacInnes

36. THE PHASE RULE AND ITS APPLICATIONS.—A study of equilibria in heterogeneous systems. Lectures and seminar. II; (2).

(Open to undergraduates having the necessary preparation.)

Prerequisite: Chemistry 31, 33; Mathematics 8 or 7 and 9.

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	36	2	—				(Arrange)			310 Ch.	Hecker

61. INDUSTRIAL CHEMICAL LABORATORY.—The preparation and purification of chemical products from raw materials on a scale sufficient to afford data for determining the economy of the processes employed. Typical forms of chemical machinery such as filter presses, vacuum pan, centrifugal separators, steam jacketed kettles, etc.; reports and estimates upon apparatus and plant for the production of some particular product on a commercial scale. (Should be accompanied by either Chemistry 6 or 109.) II; (2).

Prerequisite: Chemistry 5a and 14a-14b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	61	2	—	—	1-4	—	1-4	—	—	25 Ch.	McFarland

65. TECHNICAL GAS AND FUEL ANALYSIS.—Examination of gases, gas mixtures, flue gases, and fuels; determination of calorific values; calculation of efficiencies. *I*; (2).

Prerequisite: Chemistry 5a.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	65	2	Lecture	—	1	—	—	—	—	111 Ch.	Parr
			A, Laboratory	—	1,2,3	—	1,2,3	—	—		
			B, Laboratory	—	—	—	1,2,3	8,9	—	125 Ch.	Brodereson

66. TECHNOLOGY OF GASES.—The manufacture, constituents, and uses of the various forms of gaseous fuel; calorimetry; photometry; the more exact methods of analysis. Lectures; reading; reports; laboratory. II; (1).

Prerequisite: Chemistry 65.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	66	1	—				(Arrange)			111 Ch.	Broderson

68a. ANALYSIS OF GLASSES AND GLAZES.—(For students in ceramics.) Special problems connected with the pottery industry. *I*; (3).

Prerequisite: Chemistry 5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	68a	3	—			(Arrange)				210 Ch.	Smith

68b. CEMENT CHEMISTRY.—(For students in ceramics.) The analysis of cements; cement materials; pottery bodies. *I*; (3).

Prerequisite: Chemistry 5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	68b	3	—					(Arrange)		210 Ch.	Smith

69. METALLURGICAL LABORATORY AND ASSAYING.—The fire assay of gold, silver, lead, and copper ores, mattes, and bullion; special experiments illustrating the underlying metallurgical principles; fluxes, slags, and charge calculations; practise in the use of coal, oil, and gas furnaces, and in the measurement of high temperatures. *Fulton's Manual of Fire Assaying. I*; (2).

Prerequisite: Chemistry 5a; Geology 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	69	2	A, Laboratory	—	—	—	1-5	—	—	—	McFarland
			B, Laboratory	—	—	—	—	1-5	—	—	
			Quiz	—	—	—	—	—	10	111 Ch.	McFarland

70. ADVANCED ASSAYING AND ORE TESTING.—The assay of ores of platinum, tin, copper; bullion assay; free milling, amalgamation, and cyaniding tests. (A continuation of Chemistry 69.) *II*; (2).

Prerequisite: Chemistry 69.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	70	2	—					(Arrange)		111 Ch.	McFarland

71. ADVANCED METHODS OF METALLURGICAL ANALYSIS.—Comparison of selected methods for analyses of ores, alloys, and metallurgical products. Laboratory. *I*; (2).

Prerequisite: Chemistry 5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	71	2	—					(Arrange)		111 Ch.	McFarland

72. PAINTS, OILS, TURPENTINES, VARNISHES, AND PROTECTIVE COVERINGS FOR WOOD AND METALS.—Lectures and laboratory. *I or II*; *(2 or 5).

Prerequisite: Chemistry 5a and 14a-14b.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	72	*2 or 5	—					(Arrange)		111 Ch.	Parr

73. ASPHALT, TAR, AND OIL RESIDUES.—Their sources, characteristics, composition, and examination; binders, dust preventatives, etc., used in road construction. (For students in highway engineering.) *II*; (2).

Prerequisite: Chemistry 3 or 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	73	2	—					(Arrange)		107 Ch.	Parr

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

76. CALORIMETRY OF FUELS.—Methods for determining the heat values of solid, liquid, and gaseous fuels. (An advanced course.) *I or II*; *(1-3).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	76	*1-3	—							107 Ch.	Parr

77. COMPOSITION AND CLASSIFICATION OF COAL.—Classification, changes in composition, weathering, spontaneous combustion, formation of mine gases. Lectures; assigned reading. *II*; (1).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	77	1	—							107 Ch.	Parr

78. METALLOGRAPHY.—Constitution and microstructure of metals and alloys and the relations between their properties, chemical and mechanical treatment, and structure. Lectures; reading and laboratory. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	78	2	Conference	—	—	9	—	—	—	111 Ch.	McFarland
			Laboratory	1,2,3	—	1,2,3	—	—	—	25 Ch.	McFarland

80. THE ELEMENTS OF GLASS BLOWING.—A laboratory course in the construction and repair of glass apparatus. *II*; (1).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	80	1	—							(Arrange)	Anders

92a-92b, 93a-93b. JOURNAL MEETING.—(For juniors, seniors, and graduates.) *I, II*; (1). All members of the teaching staff in the chemical department.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	92a	1	—							213 Ch.	Derick
(Journal meeting for Juniors)											
Chemistry	93a	1	—							217 Ch.	McFarland
(Journal meeting for Seniors)											

SECOND SEMESTER

Chemistry	92b										
Chemistry	93b										

} Schedule the same as for 92a, 93a (first semester).

COURSES FOR GRADUATES

Graduate students whose major subject is in some department other than chemistry, before taking graduate work for credit in this department, must have had the equivalent of 15 university credits in chemistry, and the work covered must have included satisfactory work in general chemistry and in qualitative and quantitative analysis. Such students are advised to take Chemistry 31, 33, (or 102, 102a), 5b, 5c, 14, 9a and 9b. Courses of a more special nature will not, as a rule, be accepted for graduate work unless preceded by one of the above courses.

For students in agriculture, Chemistry 5a and 13a will not be accepted for graduate credit.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Graduate students who are candidates for an advanced degree in chemistry must have had the equivalent of 30 university credits in chemistry, and this must include satisfactory courses in general chemistry, qualitative and quantitative analysis, physical chemistry, and organic chemistry. They should have had courses in mathematics, including analytical geometry, and, if possible, the calculus. Before receiving the degree of Doctor of Philosophy such students are expected to complete work equivalent to courses 31, 33 (or 102 and 102a), 14, 9a, 9b, 101, and 111. They are advised to take at least brief courses in gas analysis, iron and steel analysis, water analysis, assaying, and chemical technology.

For students in chemistry, 5a, 13a, 9, and 9c will not be accepted for graduate credit and 9a, 9b, 14, 31 and 33 will be accepted only from students entering the Graduate School with the equivalent of 30 university credits in chemistry.

101. HISTORY OF CHEMISTRY.—Lectures. Pattison Muir's *History of Chemical Theories and Laws*, and assigned reading. *Twice a week; I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	101	$\frac{1}{2}$ unit	—							210 Ch.	Smith

(Arrange)

102. ADVANCED PHYSICAL CHEMISTRY.—This course with 102a, covers a period of two years. The subject is treated from the standpoint of Avogadro's *Principle and Thermodynamics*. The primary purpose is to develop power to handle successfully a physico-chemical problem rather than merely to impart a knowledge of the phenomena and the principles involved. Lectures and Seminar. Nernst's *Theoretische Chemie*, 7th edition. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 1, 2; Physics 1, 3; Mathematics 8a or 7 and 9. An elementary knowledge of organic and physical chemistry is desirable.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102	$\frac{3}{4}$ unit	—	—	8	—	8	—	—	114 Ch.	Washburn

[102a. ADVANCED PHYSICAL CHEMISTRY.—Chemical equilibrium; the Phase Rule; certain portions of thermochemistry; photochemistry. (A continuation of 102, with which it alternates.) Nernst's *Theoretische Chemie*. *Twice a week; I, II; ($\frac{3}{4}$ unit).* Not given 1914-1915.

Prerequisite: The same as course 102.]

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102a	$\frac{3}{4}$ unit	—	—	8	—	8	—	—	114 Ch.	Washburn

102b. ADVANCED ELECTROCHEMISTRY.—The modern theories of solution and the principles of thermodynamics in their application to the problems of electrochemistry; electrolytic conductivity and transference; electro-motive force and the energy principles underlying the transformation of chemical and electrical energy. LeBlanc's *Electrochemistry*. *Three times a week; II; (1 unit).*

Prerequisite: Chemistry 102; Mathematics 8a or 7 and 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102b	1 unit	—	8	—	8	—	8	—	114 Ch.	MacInnes

102c. ADVANCED PHYSICAL AND ELECTROCHEMISTRY.—The applications of physico-chemical methods to special problems. Laboratory. *Twice a week; I; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 31, 33; registration in Chemistry 102b, or completion of Chemistry 102, 102a, or 102b; Mathematics 8a or 7 and 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102c	$\frac{3}{4}$ unit	—					(Arrange)		114 Ch.	Washburn

102d. ELECTROCHEMISTRY.—Theoretical and applied electrochemistry, with emphasis on the technical side of the subject. (For students in electrical engineering.) *Once a week; I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102d	$\frac{1}{2}$ unit	—					(Arrange)		114 Ch.	MacInnes

102e. SPECIAL TOPICS IN PHYSICAL CHEMISTRY.—Subject for 1914-15: Photochemistry. Benrath's "*Lehrbuch der Photochemie*." *Once a week; I; ($\frac{1}{2}$ unit).*

Prerequisite: Chemistry 102 or 102a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102e	$\frac{1}{2}$ unit	—					(Arrange)		114 Ch.	Washburn

103. ADVANCED INORGANIC CHEMISTRY.—Descriptive inorganic chemistry; the rarer elements; the periodic system. Lectures, with or without laboratory. *Two to five times a week; I, II; ($\frac{1}{2}$ to $1\frac{1}{4}$ units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103	$\frac{1}{2}$ to $1\frac{1}{4}$ units	—					(Arrange)		321 Ch.	Balke

103a. ADVANCED ANALYTICAL CHEMISTRY.—Special topics. Lectures, with or without laboratory. *One to five times a week; II; ($\frac{1}{2}$ to $1\frac{1}{4}$ units).*

Prerequisite: Chemistry 5b, 9a, 9b, 14, 31, 33.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103a	$\frac{1}{2}$ to $1\frac{1}{4}$ units	—					(Arrange)		210 Ch.	Smith

103b. SPECIAL TOPICS IN INORGANIC CHEMISTRY.—Subject for 1914-1915: The Investigations and Theories of Werner. Werner, *Neuere Anschauungen auf dem Gebiete der Inorganischen Chemie*; assigned reading from later publications. Lectures and seminar. *Twice a week; I; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 9a, 9b, 14.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103b	$\frac{3}{4}$ unit	—					(Arrange)		210 Ch.	Smith

103c. SPECIAL TOPICS IN INORGANIC CHEMISTRY.—Seminar. Subject for 1914-15: The Determination of Atomic Weights. *Twice a week; II; ($\frac{3}{4}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103c	$\frac{3}{4}$ unit	—					(Arrange)		321 Ch.	Balke

103d. ADVANCED QUALITATIVE ANALYSIS.—Methods of separation; qualitative reagents; reactions of some of the less common elements. Designed especially for those intending to teach qualitative chemistry. Lectures, with or without laboratory. *One to three times a week; I; ($\frac{1}{2}$ to 1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103d	$\frac{1}{2}$ to 1 unit	—					(Arrange)		319 Ch.	Weber

104. ADVANCED ORGANIC CHEMISTRY.—Seminar. Kekule's linking theory, stereochemistry, stearic hindrance, molecular rearrangements, tautomerism, condensation, carbohydrates, ureids. Special attention to the application of modern physical chemistry to the study of organic problems, especially the application of chemical kinetics to tautomerism and to the typical reactions of organic chemistry, and the application of physical properties to the determination of chemical structure. Lectures; discussions; laboratory. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104	$\frac{3}{4}$ unit	—					(Arrange)		213 Ch.	Derick

[104a. ADVANCED ORGANIC CHEMISTRY.—(Continuation of 104, with which it alternates.) *Twice a week; I, II; ($\frac{3}{4}$ unit).*

Not given in 1914-15.]

104b. ADVANCED QUANTITATIVE ORGANIC ANALYSIS.—The quantitative chemistry of the proteins, alkaloids, glucosides, volatile oils, and other constituents of animal and vegetable tissues. Plant analysis. Toxicological analysis. Concludes with a study of the general methods, chemical and physical, of organic analysis. Lectures and seminar. May be accompanied by laboratory work on a selected group of compounds. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104b	$\frac{3}{4}$ unit	—					(Arrange)		208 Ch.	Beal

104c. SPECIAL TOPICS IN ORGANIC CHEMISTRY.—Seminar. Subject 1914-15: *Theorien der Organischen Chemie*, Henrich, 1912 edition. *Once a week; II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104c	$\frac{1}{2}$ unit	—					(Arrange)		213 Ch.	Derick

105. ADVANCED PHYSIOLOGICAL CHEMISTRY.—Selected portions of physiological chemistry not covered by Chemistry 15. *Two times a week; II; ($\frac{3}{4}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105	$\frac{3}{4}$ unit	—	9	—	9	—	9	—	217 Ch.	MacArthur

105a. ADVANCED PHYSIOLOGICAL CHEMISTRY.—Special investigations. Laboratory. *One to five times a week; II; ($\frac{3}{4}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105a	$\frac{3}{4}$ unit	—					(Arrange)		225 Ch.	MacArthur

105b. ADVANCED PHYSIOLOGICAL CHEMISTRY.—Recent contributions of importance in the field of physiological chemistry. *Two times a week; I or II; ($\frac{3}{4}$ unit).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105b	$\frac{3}{4}$ unit	—					(Arrange)		225 Ch.	MacArthur

106. ANIMAL CHEMISTRY (ANIMAL NUTRITION.)—The recent advances in the chemistry of nutrition of the lower animals; the chemistry of the functional products; the flesh, fat, milk, and wool of the more common domesticated animals. Lectures; conferences; assigned reading; laboratory. *Five times a week; I, II; (1 to $1\frac{1}{2}$ units).*

Prerequisite: Two years' work in chemistry.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	106	1 to $1\frac{1}{2}$ units	—					(Arrange)		558 Ag.	Grindley

107. CALORIMETRY.—Standards and methods. *One to three times a week; I, II; ($\frac{1}{2}$ to 1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	107	$\frac{1}{2}$ to 1 unit	—					(Arrange)		107 Ch.	Parr

107a. COMPOSITION AND CLASSIFICATION OF COAL.—Once a week. *II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	107a	$\frac{1}{2}$ unit	—					(Arrange)		107 Ch.	Parr

108. ADVANCED METALLOGRAPHY.—Advanced studies in constitution and microstructure of metals and alloys; the relations between their properties, chemical and mechanical treatment, and structure. Assigned reading and laboratory. *Twice a week; II; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 7 and 78 or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	108	$\frac{3}{4}$ unit	—					(Arrange)		111 Ch.	McFarland

109. ADVANCED INDUSTRIAL CHEMISTRY.—Seminar. Some of the more important chemical industries; the development and chemical control of processes. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 6, 9, 14, 21 or equivalent.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	109	¾ unit	—	8	—	8	—	—	—	111 Ch.	McFarland

110. WATER SUPPLIES.—The sources of contamination of water supplies and the purification of water for potable or technical use. *One to five times a week; I, II; (½ to 1¼ units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	110	½ to 1¼ units	—					(Arrange)		116 Ch.	Bartow

111. RESEARCH.—A thesis will usually be required of students taking the Master's degree and will always be required of students taking the degree of Doctor of Philosophy. (For a description of undergraduate work leading to a thesis, see Chemistry 11.) Work may be taken in the following subjects:

PHYSICAL AND ELECTROCHEMISTRY Professor WASHBURN, Dr. MACINNES

INORGANIC CHEMISTRY

Professor BALKE, Assistant Professors SMITH, WEBER

ANALYTICAL CHEMISTRY

Assistant Professor SMITH

FOOD CHEMISTRY

Dr. BEAL

ORGANIC CHEMISTRY

Professor NOYES, Assistant Professor DERICK, Dr. THORP

WATER CHEMISTRY

Professor BARTOW

ANIMAL CHEMISTRY (Animal Nutrition)

Professor GRINDLEY

PHYSIOLOGICAL CHEMISTRY

Mr. MACARTHUR

INDUSTRIAL CHEMISTRY

Professor PARR, Assistant Professor MCFARLAND

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	111	—	—					(Arrange)		106 Ch.	Noyes and others

CIVIL ENGINEERING

IRA OSBORN BAKER, C.E., D.Eng., *Professor*

ALLEN BOYER McDANIEL, B.S., *Assistant Professor*

JOHN IRA PARCEL, A.B., B.S., *Assistant Professor*

JAMES ELMO SMITH, C.E., *Assistant Professor*

WILBUR M. WILSON, M.M.E., C.E., *Assistant Professor*

CARROLL CARSON WILEY, C.E., *Associate*

NEAL BRYANT GARVER, C.E., *Associate*

GEORGE WELLINGTON PICKELS, JR., C.E., *Instructor*

WILLIAM HORACE RAYNER, C.E., *Instructor*

RAYMOND EARL DAVIS, C.E., *Instructor*

BENJAMIN LESTER BOWLING, *Assistant in Cement Laboratory*

, *Instructor*

5r. MASONRY CONSTRUCTION.—Baker's *Masonry Construction*. I; (4).

Prerequisite: Theoretical and Applied Mechanics 20, 21, 29, 10; Civil Engineering 60.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	5r	4	E	8	—	8	8	8	—	201 E. H.	} Baker, McDaniel
			F	11	11	11	—	11	—	201 E. H.	
			G	9	—	9	9	9	—	201 E. H.	

5l. CEMENT LABORATORY PRACTISE.—Standard tests for hydraulic cement. I; (1).

Prerequisite: Theoretical and Applied Mechanics 20, 21, 29, 10; Civil Engineering 60; registration in Civil Engineering 5r.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	5l	1	E	—	—	—	1-3	—	—	C. L.	} McDaniel, Bowling
			F	—	—	—	—	1-3	—	C. L.	
			G	—	2-4	—	—	—	—	C. L.	
			H	1-3	—	—	—	—	—	C. L.	

6a. THEORY OF REINFORCED CONCRETE.—The principles of reinforced concrete beams, columns, slabs, etc. Turneaure and Maurer's *Principles of Reinforced Concrete*. I; (1).

Prerequisite: Civil Engineering 5, 12, 13.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	6a	1	E	—	11	—	—	—	—	205 E. H.	} Parcel, McDaniel
			F	—	8	—	—	—	—	201 E. H.	
			G	—	—	—	10	—	—	219 E. H.	

6b. MASONRY AND REINFORCED CONCRETE DESIGN.—The design of masonry structures; reinforced-concrete beams, columns, slabs; arches, dams, retaining walls. II; (2).

Prerequisite: Civil Engineering 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	6b	2	E	—	1-3	—	1-3	—	—	214 E. H.	} Smith — —
			F	—	8-10	—	8-10	—	—	214 E. H.	
			G	—	10-12	—	10-12	—	—	214 E. H.	

6c. REINFORCED CONCRETE BUILDINGS.—(For architectural engineering students). Theory of reinforced concrete; design of reinforced concrete buildings; methods of construction; estimates of cost. Hool's *Reinforced Concrete Construction*, Vol. I, II. II; (5).

Prerequisite: Full senior standing in architectural engineering course.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	6c	5	—	1-3	1-3	2-4	1-3	2-4	—	421 E. H.	McDaniels

12. BRIDGE ANALYSIS.—The computation of the stresses in the various forms of bridge trusses, by algebraic and graphic methods, under different conditions of loading. Marburg's *Framed Structures and Girders*, Vol. I. I; (2).

Prerequisite: Theoretical and Applied Mechanics 20, 21, 29, 10; and for civil engineering students, Civil Engineering 60, and for architectural engineering students, Architecture 45.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	12	2	E	—	9	—	9	—	—	205 E. H.	Parcel,
			F	10	—	10	—	—	—	205 E. H.	Wilson.
			G	8	—	8	—	—	—	205 E. H.	Garver

13. BRIDGE DETAILS.—Inspection of a highway bridge; computation of weight and critical investigation of a highway bridge from detailed shop-drawings; detailed estimate of cost; standard details for bridges. *I*; (2). Carnegie's *Pocket Companion*, last edition.

Prerequisite: Registration in Civil Engineering 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	13	2	E	1-4	10	—	10	—	—	205, 211 E. H.	Wilson, Garver
			F	—	2-5	9	—	9	—	205, 211 E. H.	
			G	10	—	10	—	—	—	219 E. H.	
				1-4	—	—	—	—	—	211 E. H.	

14. BRIDGE DESIGN.—Design of a railroad plate girder and a truss span, with sections proportioned and details worked out, and a complete set of drawings. Marburg's *Frame Structures and Girders*, Vol. I. *II*; (5).

Prerequisite: Civil Engineering 12, 13.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	14	5	E	9-12	—	9-12	—	9-12	—	211 E. H.	Wilson, Garver
			F	1-4	—	1-4	—	1-4	—	211 E. H.	
			G	9-12	—	9-12	—	9-12	—	211 E. H.	

14a. OFFICE-BUILDING DESIGN.—(For Architectural Engineers). Design of steel-skeleton office buildings. Determination of dead-load, live-load, and wind stresses; determination of sections of girders and columns; design of floor systems and of typical details. *II*; (2).

Prerequisite: Civil Engineering 12, 13 and 31.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	14	2	—	—	8-11	—	10	—	—	421, 422 E. H.	Wilson

15. ADVANCED BRIDGE ANALYSIS.—A brief introduction to the theory of continuous, draw, cantilever, suspension, and metal-arch bridges. Merriman and Jacoby's *Roofs and Bridges, Part Four*. *II*; (2).

Prerequisite: Civil Engineering 12, 13; and registration in Civil Engineering 14.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	15	2	E	—	9	—	9	—	—	219 E. H.	Parcel
			F	—	10	—	10	—	—	219 E. H.	
			G	—	8	—	8	—	—	219 E. H.	

16. **ENGINEERING CONTRACTS AND SPECIFICATIONS.**—The law of contract; examples of general and technical clauses used in engineering specifications. Johnson's *Engineering Contracts and Specifications*. II; (2).

Prerequisite: Civil Engineering 5, 12, 13; Municipal and Sanitary Engineering 2, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	16	2	E	—	10	—	10	—	—	201 E. H.	McDaniel
			F	8	—	8	—	—	—	201 E. H.	
			G.	—	—	1	—	1	—	209 E. H.	

24. **METAL STRUCTURES.**—The design and calculation of stresses in mill and steel-skeleton buildings. Marburg's *Framed Structures and Girders*, Vol. I. I; (1).

Prerequisite: Civil Engineering 12, 13, 60.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	24	1	E	11	—	—	—	—	—	219 E. H.	Wilson
			F	—	1	—	—	—	—	219 E. H.	Parcel
			G	—	—	—	8	—	—	205 E. H.	Garver

25. **SEMINAR.**—Reading and discussion of papers. Each student presents one major and two minor papers upon assigned topics, and participates in the discussion of other papers. II; (1).

Prerequisite: Full senior standing in Civil Engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	25	1	E	—	—	1-3	—	—	—	201 E. H.	Baker
			F	10-12	—	—	—	—	—	201 E. H.	Baker
			G	—	1-3	—	—	—	—	201 E. H.	Baker

27. **PLANE SURVEYING.**—The theory, use, and adjustment of the compass, transit, and level; the computation of areas and the partitioning of land; the U. S. land survey methods, the re-establishment of corners and boundaries, and the interpretation of deeds; farm and city surveying. The field work consists of problems with the tape, compass, transit, and level. Breed and Hosmer's *Principles and Practise of Surveying*, Vol. I. I; (3).

Prerequisite: General Engineering Drawing 1, 2; Mathematics 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	27	3	E	—	8-11	8	8-11	—	—	109 E. H.	Smith, Wiley, Pickels, Rayner, Davis
			F	10	1-4	—	1-4	—	—	101 E. H.	
			G	—	1-4	2	1-4	—	—	102 E. H.	
			H	—	1-4	10	1-4	—	—	109 E. H.	

28. **HIGHER SURVEYING.**—The theory and use of the transit and plane-table in making topographic surveys; methods; the determination of latitude, longitude, and azimuth by stellar and solar observations; topographic drawing; a complete topographic survey based on a system of triangulation. Breed and Hosmer's *Principles and Practise of Surveying*, Vol. II. I; (3).

Prerequisite: Civil Engineering 27.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	28	3	E	—	8-11	8	8-11	—	—	109 E. H.	Pickels, Rayner, Davis
			F	—	9-12	10	9-12	—	—	101 E. H.	
			G	—	1-4	2	1-4	—	—	102 E. H.	
			H	—	1-4	10	1-4	—	—	109 E. H.	

31. SURVEYING.—(For students in Landscape Architecture). The theory, use, and adjustment of the compass, level, transit, and plane-table. The determination of distances by pacing, and with chain and tape; the determination of areas with compass and transit; profile leveling; elementary problems with plane-table. Breed and Hosmer's *Principles and Practise of Surveying*, Vol. I. I; (3).

Prerequisite: Mathematics 4; Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	31	3	—	—	8-11	8	8-11	—	—	102 E. H.	Pickels

32. TOPOGRAPHIC SURVEYING.—(For students in Landscape Architecture). The theory and use of the stadia; conventional topographical signs; contour construction with emphasis on its use in grading and drainage problems; advanced work with the plane-table. Each student will prepare a large scale topographic map of a portion of the campus. Breed and Hosmer's *Principles and Practise of Surveying*, Vol. II. II; (3).

Prerequisite: Civil Engineering 31.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	32	3	—	—	8-11	8	8-11	—	—	102 E. H.	Pickels

33. SURVEYING.—(For students in Geology). The use and adjustment of the compass, level, transit, and plane-table. The determination of distances by pacing, and with chain and tape; the determination of areas with the compass, and transit; differential leveling; a survey for a large scale map with plane-table. The U. S. land survey methods; problems in strike and dip. Breed and Hosmer's *Principles and Practise of Surveying*, Vol. I. I; (3).

Prerequisite: Mathematics 4; General Engineering Drawing 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	33	3	—	1-4	—	1	—	1-4	—	101 E. H.	Rayner

34. TOPOGRAPHIC SURVEYING.—(For students in Geology). The theory and use of stadia measurements; azimuth determinations from solar and stellar observations; lettering, conventional topographic signs; contour construction with emphasis on its relation to geologic formations; survey for small scale map with plane-table, barometer, and pacing methods. Breed and Hosmer's *Principles and Practise of Surveying*, Vol. II. II; (3).

Prerequisite: Civil Engineering 33.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	34	3	—	1-4	—	1	—	1-4	—	101 E. H.	Rayner

51. RAILROAD SURVEYING.—Principles of the economic location, construction, and maintenance of railways. Curves, turnouts, and earthwork. Pre-

liminary and location surveys of a line of sufficient length to secure familiarity with the methods in actual practise. Each student makes a complete set of maps, profiles, and estimates. Pickels' and Wiley's *Railroad Surveying. I*; (5).

Prerequisite: Civil Engineering 27, 28.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	51	5	E	—	1-5	—	10-12	10-12	—	105 E. H.	Smith, Wiley, Rayner, Davis
				—	—	—	1-5	—	—		
			F	—	1-5	9-11	1-5	10-12	—	102 E. H.	
										214 E. H.	

52. **ROADS AND PAVEMENTS.**—Construction and maintenance of earth, gravel, macadam, concrete, and the various forms of bituminous roads. Construction and maintenance of the various types of street pavements, and their adaptation to country roads. Road-building machinery. Effect of travel on road surfaces. Dust prevention and street cleaning. Baker's *Roads and Pavements. II*; (3).

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2; Civil Engineering 27, 28, 51.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	52	3	E	10	—	10	—	10	—	102 E. H.	} Wiley
			F	1	—	1	—	1	—	102 E. H.	
			G	9	—	9	—	9	—	102 E. H.	
			H	11	—	11	—	11	—	102 E. H.	

53. **RAILROAD SURVEYING.**—First eleven weeks of Civil Engineering 51, for municipal and sanitary engineering juniors. *I*.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	53	—	—	—	1-5	9-11	1-5	10-12	—	102, 214 E. H.	—

60. **STRUCTURAL STRESSES.**—The determination of stresses in roofs, bridges, and steel-skeleton buildings, by algebraic and graphic processes. Marburg's *Frame Structures and Girders*, Vol. I. *II*; (3).

Prerequisite: Mathematics 2, 4, 6; Theoretical and Applied Mechanics 20, 21, 29, 10; General Engineering Drawing 1, 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	60	3	E	8-10	—	8-10	—	8-10	—	101 E. H.	Parcel
			F	8-10	—	8-10	—	8-10	—	205 E. H.	Smith
			G	1-3	—	1-3	—	1-3	—	109 E. H.	Garver
			H	8-10	—	9-11	—	9-11	—	122 E. H.	Pickels

62. **STRUCTURAL DETAILS.**—A study of the details of roofs, bridges, and steel-frame buildings; computations of weight and estimate of cost of an actual structure. *II*; (3). Carnegie's *Pocket Companion*, last edition.

Prerequisite: Registration in Civil Engineering 60.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	62	3	E	—	8-12	—	8-12	—	—	211 E. H.	} Smith, McDaniel, Garver
			F	—	8	—	8	—	—	205 E. H.	
				—	9-12	—	9-12	—	—	211 E. H.	
			G	—	1-5	—	1-5	—	—	211 E. H.	
			H	1-5	—	1-5	—	—	—	214 E. H.	

70. SEMINAR.—Reading and discussion of papers. Each student presents one major and two minor papers upon assigned topics, and participates in the discussion of other papers. *II*; (1).

Prerequisite: Full junior standing in Civil Engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	70	1	E	—	—	—	—	1-3	—	122 E. H.	McDaniel, Rayner, Davis
			F	2-4	—	—	—	—	—	219 E. H.	
			G	—	—	—	—	10-12	—	201 E. H.	
			H	—	8-10	—	—	—	—	201 E. H.	

96. SURVEYING.—U. S. public land surveys; principles of re-establishing corners. Use of transit in finding distances, areas, and in laying out buildings; use of the level in finding profiles and contours. (For students in mechanical engineering.) Pence and Ketchum's *Surveying Manual*; *II*; (2).

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2; Physics 1a-1b, 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	96	2	—	—	1-3	—	1-3	—	—	101 E. H.	—

99-100. THESIS.—A problem in investigation or design, subject to the approval of the head of the department. Only students of high standing are permitted to take a thesis. Students not taking a thesis substitute such regular class work as is approved by the head of the department. *I*; (1); *II*; (2).

Professor BAKER

Prerequisite: Full senior standing in Civil Engineering.

THE CLASSICS

HERBERT JEWETT BARTON, A.M., *Professor, Chairman*

CHARLES MELVILLE MOSS, Ph.D., *Professor*

WILLIAM ABBOTT OLDFATHER, Ph.D., *Associate Professor*

ARTHUR STANLEY PEASE, Ph.D., *Associate Professor*

HOWARD VERNON CANTER, Ph.D., *Assistant Professor*

Majors

A major in the Classics consists of 20 hours in Greek and Latin, of which at least 6 shall be in the secondary language and the remaining hours in the primary language. Only those courses may count toward the major in the Classics which count toward a major in Greek and Latin respectively.

A major in Greek consists of 20 hours, not including Greek 1, 17, 18, 19.

A major in Latin consists of 20 hours, not including Latin 12. Latin 1 may be counted for half credit only.

Honors

For honors in Greek, the major shall be the ordinary one of 20 hours, as defined above; the minors shall be Latin and one other foreign language, or history, or philosophy, or English literature. Neither minor shall consist of less than 8 hours, and the two together must aggregate not less than 20 hours. No course may be counted toward these minors which is not counted toward a major in the department concerned.

For honors in Latin, the major shall consist of 20 hours and shall include Latin 14 and 16; the minors shall be at least one other foreign language, preferably Greek, and one of the following: English literature, a modern language, history, or philosophy, with the same conditions as in the case of Greek.

GREEK

COURSES FOR UNDERGRADUATES

The courses in translation naturally follow one another in this sequence: 1, 3, 4, 5 (7), 6 (8). Courses 1, 3, and 4 are intended for students who cannot present Greek for entrance to the University, but who desire to commence the study of the language. Course 2 may be taken after course 1 and course 14 after courses 5 or 7. 16, 17, 18, and 19 are open to sophomores, juniors, and seniors; 20 is open to those who have completed one year in history or in classics.

1a-1b. GRAMMAR AND READER.—a (first semester), Attic forms; reading of simple prose; b (second semester), Xenophon's *Anabasis*, Book I. I, II; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	1a	4	—	—	11	11	11	11	—	114 L. II.	Oldfather

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	1b	4		Schedule the same as for 1a (first semester).							

2a-2b. NEW TESTAMENT GREEK.—a (first semester), Reading of selections; b (second semester), Lectures on Canon and Text. I, II; (2).

Prerequisite: Greek 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	2a	2	—	—	10	—	10	—	—	124 L. H.	Moss

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	2b	2		Schedule the same as for 2a (first semester).							

3. SECOND YEAR GREEK.—Xenophon's *Anabasis*, Books II-IV; Grammatical drill. I; (3).

Prerequisite: Greek 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	3	3	—	10	—	10	—	10	—	124 L. H.	Canter

4. SECOND YEAR GREEK.—Homer, six Books of the *Iliad*. II; (3).

Prerequisite: Greek 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	4	3	—	10	—	10	—	10	—	124 L. H.	Canter

5. HERODOTUS.—Selections, including portions of Books VI-VIII. Greek lyric poets. *II*; (3).

Prerequisite: Greek 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	5	4	—	9	—	9	—	9	—	114 L. H.	Moss

6. THUCYDIDES.—The Sicilian Expedition, Books VI-VII. *I*; (3).

Prerequisite: Greek 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	6	3	—	9	—	9	—	9	—	124 L. H.	Pease

14. GREEK PROSE COMPOSITION.—*II*; (1).

Prerequisite: Greek 5 and 6 or 7 and 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	14	1	—	—	—	—	—	11	—	124 L. H.	Moss

GREEK LIFE AND LITERATURE IN ENGLISH

(Courses 16-20 presuppose no knowledge of Greek and are open to all students except freshmen.)

16. THE PRIVATE AND PUBLIC LIFE OF THE GREEKS.—Lectures illustrated by photographs and slides; prescribed readings; *I*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	16	1	—	—	—	—	3	—	—	120 L. H.	Moss

17. GREEK POETRY IN TRANSLATIONS.—*I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	17	2	—	—	11	—	11	—	—	124 L. H.	Moss

18. GREEK PROSE IN TRANSLATIONS.—*I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	18	2	—	11	—	11	—	—	—	120 L. H.	Moss

19. GREEK DRAMA IN TRANSLATIONS.—*II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	19	2	—	—	11	—	11	—	—	124 L. H.	Moss

20. GREEK HISTORY.—(This course is described by the department of history as History 5.) *I*; (3).

Prerequisite: One course in history or the classics. Not open to freshmen.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	20	3	—	3	—	3	—	3	—	120 L. H.	Oldfather

COURSES FOR GRADUATES

104. HOMER AND THE HOMERIC QUESTION.—Lectures and reading in alternate hours. *I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	104	1 unit	—							(Arrange)	Oldfather

107. GREEK ORATORY.—One or more speeches of each of several orators; lectures and reports. *I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	107	1 unit	—	—	8	—	8	—	—	114 L. H.	Moss

110. PROSEMINAR.—*Once a week. I, II; (¼ unit).*

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	110	¼ unit	—	2	—	—	—	—	—	104 L. H.	Oldfather, Pease, and others

LATIN

1a-1b. OVID AND VIRGIL.—a (first semester), selections from the Amores, Heroides, and Metamorphoses; b (second semester), selections from the Aeneid. *I, II; (4).*

Prerequisite: Three entrance units in Latin.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	1a	4	—	—	8	8	8	8	—	120 L. H.	Canter, Pease

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	1b	4		Schedule the same as for 1a (first semester).							

2a-2b. LIVY, PLAUTUS AND TERENCE.—a (first semester), selections from Livy, the story of Hannibal; b (second semester), the Rudens of Plautus and the Phormio of Terence. *I, II; (4).*

Prerequisite: Four entrance units in Latin.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	2a	4	—	—	9	9	9	9	—	120 L. H.	Barton

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	2b	4		Schedule the same as for 2a (first semester).							

3. SALLUST AND CICERO.—Selections from the Jugurthine War; De Senectute. *I; (3).*

Prerequisite: Latin 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	3	3	—	9	—	9	—	9	—	114 L. H.	Canter

4. HORACE AND CATULLUS.—Selections. *II*; (3).*Prerequisite:* Latin 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	4	3	—	10	—	10	—	10	—	120 L. II.	Oldfather

5a-5b. LATIN COMPOSITION.—Grammatical drill and practise in the simpler forms of expression. *I, II*; (1).

Prerequisite: Latin 1 or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	5a	1	—	8	—	—	—	—	—	120 L. H.	Canter

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	5b	1		Schedule the same as for 5a (first semester).							

ROMAN LIFE AND LITERATURE IN ENGLISH

(Courses 12 and 13 presuppose no knowledge of Latin; open to all students except freshmen).

12. VIRGIL AND HORACE IN ENGLISH TRANSLATIONS.—The Aeneid and selections from Horace. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	12	2	—	—	3	—	3	—	—	114 L. II.	Barton

13. ROMAN LIFE.—The family, organization of society, education, marriage, amusements, with some attention to the monuments. Lectures and assigned readings illustrated by photographs and slides. *II*; (1).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	13	1	—	—	—	—	3	—	—	120 L. H.	Barton

19. ROMAN HISTORY.—(This course is described by the department of history as History 6.) Not open to freshmen. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	19	3	—	3	—	3	—	3	—	120 L. H.	Barton

9. TEACHERS' COURSE.—The purpose and methods of preparatory Latin instruction; the teacher's preparation. *II*; (2).

Prerequisite: 18 hours in Latin. A portion of this requirement may be waived in the case of those who have taught Latin.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	9	2	—	—	11	—	11	—	—	120 L. H.	Barton

10. LATIN COMPOSITION.—The leading principles; imitation of assigned models. *I*; (2).

Prerequisite: 12 hours in Latin, including Latin 5 or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	10	2	—	—	11	—	11	—	—	120 L. H.	Barton

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

7. HORACE AND JUVENAL.—Selections from the Satires and Epistles of Horace; selected Satires of Juvenal. *I*; (3).

Prerequisite: 12 hours in Latin.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	7	3	—	10	—	10	—	10	—	114 L. H.	Pease

14. SENECA.—Selections from his letters and tragedies. *II*; (3).

Prerequisite: 18 hours in Latin.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	14	3	—	11	—	11	—	11	—	120 L. H.	Barton

[16. MARTIAL AND SUETONIUS.—Selections; lectures on literary history. *II*; (3). Not given in 1914-15.

Prerequisite: 18 hours in Latin.]

22. LATE LATIN.—Rapid reading of selections from the Latin writers from Minucius Felix to Cassiodorus. *II*; (2).

Prerequisite: This course is open to seniors and graduates who have had two years of college Latin or who otherwise satisfy the instructor of their ability to do the work required.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	22	2	—	—	2	—	2	—	—	114 L. H.	Pease

COURSES FOR GRADUATES

Students desiring to take graduate work in Latin should have had at least three years of college Latin in addition to the Latin presented to meet entrance requirements.

103. CICERO.—*De Natura Deorum* and *De Divinatione*; twice a week. *I*; ($\frac{1}{2}$ unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	103	$\frac{1}{2}$ unit	—	—	9	—	9	—	—	114 L. H.	Pease

104. LATIN PALEOGRAPHY.—Twice a week. *I*; ($\frac{1}{2}$ unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	104	$\frac{1}{2}$ unit	—	—	10	—	10	—	—	104 L. H.	Pease

[106. TERENCE AND LATIN COMEDY.—Twice a week. *I*; ($\frac{1}{2}$ unit). Not given in 1914-1915.]

107. LATIN EPIGRAPHY.—*Twice a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	107	$\frac{1}{2}$ unit	—	—	9	—	9	—	—	104 L. H.	Pease

108. TACITUS.—*The Histories. Twice a week. I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	108	$\frac{1}{2}$ unit	—	10	—	10	—	—	—	120 L. H.	Barton

109. VIRGIL.—*Twice a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	109	$\frac{1}{2}$ unit	—	9	—	9	—	—	—	124 L. H.	Pease

110. PROSEMINAR.—*Once a week. I, II; ($\frac{1}{4}$ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	110	$\frac{1}{4}$ unit	—	2	—	—	—	—	—	104 L. H.	Oldfather, Pease, and others

112. ROMAN HISTORIOGRAPHY.—*Twice a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	112	$\frac{1}{2}$ unit	—	—	10	—	10	—	—	114 L. H.	Canter

114. CAESAR.—*Twice a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	114	$\frac{1}{2}$ unit	—							(Arrange)	Oldfather

DAIRY HUSBANDRY

HARRY ALEXIS HARDING, Ph.D., *Professor, Dairy Bacteriology*WILBUR JOHN FRASER, M.S., *Professor, Dairy Husbandry*MARTIN JOHN PRUCHA, Ph.D., *Assistant Professor, Dairy Bacteriology*NELSON WILLIAM HEPBURN, M.S., *Assistant Professor, Dairy Manufactures*LEROY LANG, M.S., *Associate, Dairy Manufactures*ROYDEN EARL BRAND, M.S., *Associate, Dairy Husbandry*FRANK A. PEARSON, *Instructor, Dairy Husbandry*WILLIAM TRUMAN CRANDALL, M.S., *Associate, Milk Production*HARRISON AUGUST RUEHE, B.S., *Instructor, Dairy Manufactures*RAY STILLMAN HULCE, M.S., *Instructor, Milk Production*OLIVER ARNOLD KELLER, B.S., *Assistant, Dairy Manufactures*WILLIAM WODIN YAPP, B.S., *Assistant, Dairy Husbandry*HARRY MONTGOMERY WEETER, A.B., *Assistant, Dairy Husbandry*WILLIAM BARBOUR NEVENS, B.S., *Assistant, Dairy Husbandry*FRANK TURNER, B.S., *Assistant, Dairy Husbandry*P. W. ALLEN, *Assistant, Dairy Bacteriology*

1. MILK TESTING.—Official testing; inspectors' methods; tests for purity and adulteration; lactometer; acid tests; tests for preservatives; butter analysis; moisture, salt and fat tests; lectures; assigned readings; laboratory practise. (Alternates with Dairy Husbandry 16 if desired.) *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	1	3	Lecture	—	10	—	—	—	—	701 Ag.	Hepburn
Husbandry			Quiz	—	—	—	10	—	—	701 Ag.	Hepburn
			Laboratory	—	11	—	11	—	10,11	503 Ag.	Hepburn, and Keller

2. DAIRY CATTLE.—Dairy type and its relation to milk and butter fat production; origin and history of breeds; their characteristics, type and adaptability and the various markets and climatic conditions; prominent families and individuals in principal breeds; herd improvement; selection of animals on performance, breeding and physical conformation; grading up by use of superior sires. Lectures; recitations; judging. A, Lectures; B, Laboratory. *II*; (4).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	2	4	A	9	—	9	—	—	—	701 Ag.	Crandall
Husbandry			B	—	8,9	—	8,9	—	—	S. P.	Crandall

3. ELEMENTS OF DAIRY HUSBANDRY.—The dairy herd; dairy sanitation; milk testing; milk products. Required of all freshmen in the general course in Agriculture. Lectures; demonstrations. *I* or *II*; (1).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	3	1	—	—	10,11	—	1,2	—	—	701 Ag.	Hulce
Husbandry											and others

4. ICE CREAM MAKING.—Principles of ice cream making. Types of freezers and methods of freezing. Mixing and freezing of ice cream, sherbets, puddings and other frozen products. Study of flavoring extracts, fillers and binders. Ice cream standards. *II*; (2).

Prerequisite: Dairy Husbandry I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	4	2	—	—	10,11	—	10,11	—	—	454 Ag.	Ruehe
Husbandry											

7. CREAMERY BUTTERMILK MAKING AND FACTORY MANAGEMENT.—Types of creameries; raw product received; grading; pasteurization; use of commercial starters; ripening; churning; salting; working butter. Butter composition; uniformity and methods of control; butter scoring. Creamery accounting and business methods; co-operative and centralized management; sale of creamery by-products; refrigerating; location and creamery plans; disposal of creamery sewage. Lectures; assigned readings; laboratory practise. *II*; (5).

Prerequisite: Dairy Husbandry I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	7	5	—	1,2	1,2	1,2	1,2	1,2	—	454 Ag.	Hepburn
Husbandry				—	—	—	—	—	8,9,10	Creamery Lab.	and Lang

8. CITY MILK SUPPLY.—Consideration of the problems connected with the production, transportation, and delivery of city milk. Especial emphasis upon the sanitary aspects. *II*; (2).

Prerequisite: Dairy Husbandry 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	8	2	—	8	—	—	—	—	8	454 Ag.	Harding
Husbandry											

11. DAIRY BACTERIOLOGY.—General survey of the bacteria of milk and its products from the udder to the consumer, giving attention to their methods of introduction, their effect upon the milk and methods for their control. *A*, Lectures; *I*; (1); *B*, Laboratory; *I*; (4). (May be taken separately or to—

Prerequisite: Bacteriology 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	11	1	A	8	—	—	—	—	—	454 Ag.	} Harding
Husbandry		4	B	—	8,9	8,9	8,9	8,9	—	454 Ag.	

16. FEEDING DAIRY CATTLE.—Compounding rations for dairy cows; preparation of feeds; study of station feeding tests; effect of feeds on milk products; calf raising, feeding and general care; barn arrangement, with reference to storage and feeding; types of mangers; silos, location and types. Opportunity will be given to study the feeding of the University dairy herds as well as the types of silos in use. (Alternates with Dairy Husbandry 1 if desired). *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	16	3	—	10	—	10	—	10	—	128 Ag.	Hulce
Husbandry											

17. ADVANCED STUDY OF DAIRY BREEDS.—The origin and history of dairy breeds; history of prominent families and noted individuals, their characteristics and producing abilities; pedigree work with special emphasis upon performance records; advanced registry systems; problems peculiar to the breeder of pure-bred dairy cattle. The student may specialize in the particular breed in which he is interested. Lectures; assigned readings; seminar work. *I*; (2).

Prerequisite: Dairy Husbandry 2 and 16.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	17	2	—	—	3	—	3	—	—	128 Ag.	Crandall
Husbandry											

19. FARM DAIRYING.—Existing conditions and farm butter making; systems of creaming milk; cooling and storing cream; ripening, churning, working, and marketing butter; the care and use of the hand separator; the various makes of machines; plans of dairy houses for various products. Lectures; laboratory practise. *I*; (2).

Prerequisite: Dairy Husbandry 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	19	2	—	—	1,2	—	1,2	—	—	454 Ag.	Hepburn, Keller

21. SYSTEMS OF DAIRY FARMING.—Relation of the cow and the herd to profits; how to establish and perpetuate a dairy herd of the highest efficiency; economy of crops and rations on a dairy farm; systems of cropping; the organization of a dairy farm; location and arrangement of buildings and lots; farm accounts, records and inventories; markets; care and disposal of milk at the greatest profit. *II*; (5).

Prerequisite: Dairy Husbandry 2 and 16.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	21	5	—	10	10	10	10	10	—	553 Ag.	Fraser

22. CHEESE MAKING.—Ripening and setting milk; cutting, cooking, and dipping curd; cheddaring, milling, matting, and salting curds; pressing and curing cheese; cottage, Neufachtel, and other varieties of cheese; practise in making more common varieties. Alternates with Dairy Husbandry 19 if desired. *I*; (3).

Prerequisite: Dairy Husbandry 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	22	3	—	1,2	—	1,2	—	1,2	—	454 Ag.	Lang, Keller

COURSES FOR GRADUATES

101. ECONOMIC MILK PRODUCTION.—Differences in the efficiency of dairy cows, cause and effect of the same, and the relation this bears to successful dairy farming. *Twice a week. I, II*; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	101	1 unit	—							(Arrange)	Fraser

102. RESEARCH.—The investigations in progress in the dairy herds of the state. *I, II*; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	102	1 unit	—							(Arrange)	Fraser

103. RESEARCH.—Dairy Feeding Problems. *I, II*; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	103	1 unit	—							(Arrange)	Fraser

104. DAIRY BACTERIOLOGY.—*I, II*; (2 units).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	104	2 units	—							(Arrange)	Harding

ECONOMICS

(Including ACCOUNTANCY.)

(See Courses in Accountancy Listed Separately.)

(Including Accountancy. See Courses in Accountancy Listed Separately.)

DAVID KINLEY, Ph.D., LL.D., *Professor**MAURICE HENRY ROBINSON, Ph.D., *Professor*ERNEST RITSON DEWSNUP, A.M., *Professor*ERNEST LUDLOW BOGART, Ph.D., *Professor*GEORGE ENFIELD FRAZER, A.B., LL.B., *Professor*WILLIAM ARTHUR CHASE, LL.B., C.P.A., *Lecturer, in charge of work in Accountancy*NATHAN AUSTIN WESTON, Ph.D., *Assistant Professor*SIMON LITMAN, Dr. Jur. Pub. et Rer. Cam., *Assistant Professor*RALPH EMERSON HEILMAN, Ph.D., *Assistant Professor*CHARLES MANFRED THOMPSON, Ph.D., *Associate*JOHN GIFFEN THOMPSON, Ph.D., *Instructor*HIRAM THOMPSON SCOVILL, A.B., *Instructor*HARRISON MCJOHNSTON, A.M., *Instructor*ELMORE PETERSEN, A.B., *Assistant*WILLIAM HENRY DREESEN, A.B., *Assistant*EDWARD LAWRENCE MCKENNA, A.B., *Assistant*CHARLES KELLY KNIGHT, A.M., *Assistant*

Courses 7 (English Economic History), 22 (Economic History of the United States), and 26 (Economic Resources), are open to freshmen without previous requirement. Course 27 is also open to freshmen, but requires credit in course 26 or an approved high school course in commercial geography.

Courses 4a-4b, 5, 8, 10, 11, 12, 13, 17, 19, 20, 21, 29, 30, 41, 42, 43a-43b, 45a-45b, and 51 are open to graduates and advanced undergraduates.

Courses numbered 101 and above are open to graduate students only.

The courses in accountancy and commercial law, which are given in the Department, may not be counted towards a major in economics.

COURSES FOR UNDERGRADUATES

I. PRINCIPLES OF ECONOMICS.—I; (5).

Prerequisite: At least thirty hours of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	1	5	Lecture	—	11	—	11	—	—	100 Com.	Weston
			A, Quiz	11	—	11	—	11	—	210 Com.	Dewsnup
			B, Quiz	11	—	11	—	11	—	312 Com.	Thompson,
											J. G.
			C, Quiz	11	—	11	—	11	—	101 Com.	McKenna
			D, Quiz	11	—	11	—	11	—	307 Com.	Knight
			E, Quiz	11	—	11	—	11	—	111 Com.	Petersen
			F, Quiz	8	—	8	—	8	—	312 Com.	Thompson,
											J. G.
			G, Quiz	8	—	8	—	8	—	307 Com.	McKenna
			H, Quiz	8	—	8	—	8	—	308 Com.	Knight

*On leave.

2. PRINCIPLES OF ECONOMICS.—Section A open to junior and senior engineering students only; section C open to junior and senior agricultural students only. *I or II; (2).*

Prerequisites Junior or senior standing in the Colleges of Engineering or Agriculture.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	2	2	A1, Engineering	8	—	8	—	—	—	111 Com.	Heilman
			A2, Engineering	8	—	8	—	—	—	204 Com.	Litman
			A3, Engineering	8	—	8	—	—	—	101 Com.	Thompson, C. M.
			C1, Agriculture	3	—	3	—	—	—	312 Com.	Thompson, J. G.
			C2, Agriculture	3	—	3	—	—	—	111 Com.	Heilman
			C3, Agriculture	—	3	—	3	—	—	101 Com.	Thompson, C. M.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
				—	—	1	—	1	—	111 Com.	Thompson, J. G.

3. MONEY AND BANKING.—The history and theory of money, credit, and banking. *II; (3).*

Prerequisite: Economics I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	3	3	Lecture	11	—	—	—	—	—	100 Com.	Weston
			A, Quiz	—	11	—	11	—	—	206 Com.	Weston
			B, Quiz	—	—	11	—	11	—	111 Com.	Thompson, C. M.
			C, Quiz	—	—	11	—	11	—	307 Com.	McKenna
			D, Quiz	—	11	—	11	—	—	307 Com.	McKenna
			E, Quiz	—	—	11	—	11	—	308 Com.	Knight

[4a-4b. FINANCIAL HISTORY OF THE UNITED STATES.—The first semester's work is confined to colonial and federal finance, including currency, banking, tariff, and fiscal questions, to the period of the Civil War. The second semester's work deals with the finances of the Civil War and Reconstruction periods, and the recent development of both public and private finance, with special reference to business conditions. Either semester's work may be taken separately. *I, II; (2).* Not given in 1914-15.

Prerequisite: Economics 3 and senior standing.]

5. PUBLIC FINANCE.—Public expenditures; financial administration; taxation; public debts. *I; (3).*

Prerequisite: Economics I and 3. Students who have had 6 hours in history and Political Science I, and who present a statement from the department of political science showing that they are taking political science as a major, may be admitted without Economics 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	5	3	—	10	—	10	—	10	—	101 Com.	Rogart

6. BUSINESS ORGANIZATION.—Business enterprises and their organization; characteristics and relative advantages of individual proprietorship, partnership, and corporation. Organization for operating purposes and the effect of the organization on business and technical efficiency. The organization and work of commercial and industrial associations. *II*; (2).

Prerequisite: Economics 1, and 3 either preceding or concurrent. Open to students of business administration only.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	6	2	A	—	10	—	10	—	—	101 Com.	Petersen
			B	—	11	—	11	—	—	101 Com.	Petersen

7. ENGLISH ECONOMIC HISTORY.—The industrial development of England; the manorial system; the guilds; the commercial policy and expansion of the seventeenth and eighteenth centuries; the industrial and manufacturing growth of the nineteenth century. Open to freshmen and sophomores only. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	7	3	Lecture	9	—	—	—	—	—	100 Com.	Bogart
			A, Quiz	—	—	9	—	9	—	101 Com.	Bogart
			B, Quiz	—	9	—	9	—	—	101 Com.	Bogart
			C, Quiz	—	—	9	—	9	—	111 Com.	Thompson, C. M.
			D, Quiz	—	9	—	9	—	—	111 Com.	Thompson, C. M.
			E, Quiz	—	—	9	—	9	—	308 Com.	Dreesen

8. THE MONEY MARKET.—Dealings in money and credit; the functions of money broker and banker; the concentration of financial dealings at such centers as New York and London; international payments and the determination of rates of foreign exchange; the seasonal demands for money; causes of fluctuation in rates of discount; monetary panics and crises; investments; the financial aspects of dealings on the stock and produce exchanges. *II*; (2).

Prerequisite: Economics 9. Open to students of business administration only.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	8	2	—	—	—	11	—	11	—	206 Com.	Weston

9. PRACTICAL BANKING.—Banking practise in the United States. *I*; (2).

Prerequisite: Economics 3; senior standing. Open to students of business administration only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	9	2	—	—	—	11	—	11	—	206 Com.	Weston

10. CORPORATION MANAGEMENT AND FINANCE.—The growth of corporations; their causes and forms; the promotion, financing, incorporation, and capitalization of corporate consolidations; their organization and securities; position and relation of stock-holders and directors, analysis of reports, stock speculation, relations of industrial corporations to international competition, receiverships and reorganizations; social and political effects. *II*; (3).

Prerequisite: Economics 1 and 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	10	3	A	10	—	10	—	10	—	312 Com.	Heilman
			B	11	—	11	—	11	—	312 Com.	Heilman

[II. INDUSTRIAL CONSOLIDATION.—The development of industrial consolidation; the growth of monopoly, monopoly prices and methods, the ability of trusts to effect prices, wages, interest, and profits; and the proposed plans for controlling trusts. *II*; (3). Not given in 1914-15.

Prerequisite: Economics 10.]

12. LABOR PROBLEMS.—The condition and claims of labor and the principles underlying them. *I*; (3).

Prerequisite: Economics 1 and 3. Students who have had 6 hours in history and Sociology 1 and who present a statement from the department of sociology showing that they are taking sociology as a major, may be admitted without Economics 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	12	3	—	2	—	2	—	2	—	206 Com.	Heilman

13. ECONOMIC DEVELOPMENT OF EUROPE SINCE THE INDUSTRIAL REVOLUTION.—The economic history of France, Germany, and England since the period of the industrial revolution. *II*; (3).

Prerequisite: At least sixty hours of university work, including Economics 1 and 3. Students who present a statement from the department of history showing that they are taking history as a major, may be admitted without Economics 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	13	3	—	10	—	10	—	10	—	206 Com.	Bogart

14. AGRICULTURAL COOPERATION.—The organization, financing, and management of cooperative associations for the promotion of various branches of farming. Open to junior and senior students of agriculture only. *II*; (2).

Prerequisite: Economics 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	14	2	—	—	2	—	2	—	—	307 Com.	Petersen

15. RURAL CREDIT.—The credit and banking needs of farmers and rural communities generally; the ways and means of supplying them. Open to junior and senior students of agriculture only. *I*; (2).

Prerequisite: Economics 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	15	2	—	—	2	—	2	—	—	206 Com.	Weston

16. ECONOMIC PROBLEMS.—Section A: Railway problems; taxation of corporations; the labor question. Section C: Special topics relating to agri-

culture. A open to students of engineering only; C open to students of agriculture only. *II*; Sec. A. (2); Sec. C (3).

Prerequisite: Economics 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	16	2	A	—	11	—	11	—	—	111 Com.	Dewsnup
		3	C	3	—	3	—	3	—	312 Com.	Thompson, J. G.

17. ECONOMIC HISTORY OF AGRICULTURE.—General characteristics of agriculture and its development as an industry in various countries at various times. Land tenure and landed property. Large, medium, and small farms or estates. Economic conditions and results of extensive and intensive culture. Agricultural credit and markets. Agricultural labor. State of the agricultural class. Organization in agriculture. Relation of agriculture to other industries. Relation of the state to agriculture. General aspects of farm management. *II*; (2).

Prerequisite: Economics 1 and 3 and senior standing. Seniors in the College of Agriculture who have had Economics 1 or 2 may be admitted to the course by special permission of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	17	2	—	—	3	—	3	—	—	312 Com.	Thompson, J. G.

18a-18b. SENIOR SEMINAR.—Investigation in economics, commerce, and industry; the preparation of theses. Business students and others making economics a major should take this course. *I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	18a	2	—	—	—	—	—	—	—	(Arrange)	Dewsnup

SECOND SEMESTER

Economics	18b	2	—	—	—	—	—	—	—	(Arrange)	Dewsnup
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19. UNITED STATES INDUSTRY, 1820-1860.—Growth, distribution, and character of the population, with special reference to the public domain and the Western movement; development of inland communication and transportation; foreign commerce and the carrying trade; distribution, extent, and methods of agriculture; manufacturing, labor and labor saving machinery; currency and banking; the tariff. *I*; (2).

Prerequisite: Open to graduates and seniors who have had Economics 1 and are taking a major in one of the social sciences.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	19	2	—	—	10	—	10	—	—	206 Com.	Thompson, C. M.

20. UNITED STATES INDUSTRY SINCE 1860.—Agriculture, with special reference to improved methods and the effect of exploiting new lands; development of the factory system; labor and its organization; evolution of the "big business"; growth of urban centers; mining; immigration and its economic effects;

monetary questions; railroads and the regulation of interstate trade; foreign commerce; the tariff. *II*; (2).

Prerequisite: Open to graduates and seniors who have had Economics I and are taking a major in one of the social sciences.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	20	2	—	—	10	—	10	—	—	206 Com.	Thompson, C. M.

21. SOCIALISM AND ECONOMIC REFORM.—The important socialistic theories. *II*; (3).

Prerequisite: Economics I and 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	21	3	—	2	—	2	—	2	—	206 Com.	Heilman

22. THE ECONOMIC HISTORY OF THE UNITED STATES.—The explorations and settlements that led to the colonization of this continent; the growth of industry, agriculture, commerce, transportation, and labor from the simple, isolated agricultural communities of the colonies to the complex industrial and commercial society of today. Open to freshmen and sophomores only. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	22	3	Lecture	9	—	—	—	—	—	100 Com.	Bogart
			A, Quiz	—	—	9	—	9	—	101 Com.	Bogart
			B, Quiz	—	9	—	9	—	—	101 Com.	Bogart
			C, Quiz	—	—	9	—	9	—	111 Com.	Thompson, C. M.
			D, Quiz	—	9	—	9	—	—	111 Com.	Thompson, C. M.
			E, Quiz	—	—	9	—	9	—	307 Com.	Knight
			F, Quiz	—	9	—	9	—	—	307 Com.	Knight
			G, Quiz	—	—	9	—	9	—	308 Com.	Thompson, J. G.
			H, Quiz	—	9	—	9	—	—	308 Com.	Thompson, J. G.
			I, Quiz	—	10	—	10	—	—	111 Com.	McKenna
			J, Quiz	—	2	—	2	—	—	111 Com.	Thompson, C. M.

23. ELEMENTARY LAW.—The law of contracts, leases, landed property, etc. Open to junior and senior students of agriculture only. *II*; (3).

Prerequisite: Economics 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	23	3	—	1	—	1	—	1	—	312 Com.	—

25a-25b. COMMERCIAL LAW.—Contracts; negotiable instruments; agency; partnerships; business corporations; sales of personal property; bailments and carriers; guaranty and suretyship; insurance. The course may not be counted towards a major in economics. *I, II*; (2).

Prerequisite: At least sixty hours of university credit including Economics I and Accountancy 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	25a	2	—	11	11	—	—	—	—	308 Com.	Chase

SECOND SEMESTER

Economics	25b	2	Schedule the same as for 25a (first semester).								
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26. ECONOMIC RESOURCES.—Environmental influences affecting commercial and industrial development; the more important products and industries of different countries; the extent and distribution of the resources and the industrial and commercial activities of the United States. Open to freshmen and sophomores only. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	26	3	Lecture	10	—	—	—	—	—	100 Com.	Litman
			A, Quiz	—	—	10	—	10	—	204 Com.	Litman
			B, Quiz	—	10	—	10	—	—	204 Com.	Litman
			C, Quiz	—	—	10	—	10	—	307 Com.	Petersen
			D, Quiz	—	10	—	10	—	—	307 Com.	Petersen
			E, Quiz	—	—	10	—	10	—	308 Com.	Dreesen
			F, Quiz	—	2	—	2	—	—	307 Com.	Dreesen

27. MODERN INDUSTRIES.—The raw materials of commerce; their geographical distribution and their economic significance; the leading industries engaged in the utilization of these materials; the sources of power; the investment of capital; the employment of men and of machinery; the progressive stages of production; the distribution of finished commodities. Open to freshmen and sophomores only. *II*; (3).

Prerequisite: Economics 26, or an approved high school course in commercial geography.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	27	3	Lecture	10	—	—	—	—	—	100 Com.	Litman
			A, Quiz	—	—	10	—	10	—	204 Com.	Litman
			B, Quiz	—	10	—	10	—	—	204 Com.	Litman
			C, Quiz	—	—	10	—	10	—	307 Com.	Dreesen
			D, Quiz	—	10	—	10	—	—	307 Com.	Dreesen
			E, Quiz	—	2	—	2	—	—	204 Com.	Dreesen

28. MECHANISM AND TECHNIQUE OF DOMESTIC COMMERCE.—Buying and selling in internal trade; forms of wholesale and retail trade organizations; markets, fairs, auctions, stock and produce exchanges; department, mail-order, and cooperative stores; commercial travelers; commercial competition; theory and practise of modern advertising; mercantile credit. *I*; (3).

Prerequisite: Economics 1, 3 and 26 or 27.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	28	3	—	9	—	9	—	9	—	205 Com.	Litman

[29. FOREIGN COMMERCE AND COMMERCIAL POLITICS.—Problems arising in connection with international trade relations, and various attempts to solve them; changes in theories and in policies; economic systems (mercantile, free-trade, protective); classes of customs tariffs; commercial treaties; promotion of ship-

ping; institutions for furthering export trade (commercial museums, consular service.) *I*; (3). Not given in 1914-15.

Prerequisite: Economics 1, 3 and 26 or 27.]

[30. **TARIFF AND CUSTOMS REGULATIONS OF THE UNITED STATES.**—The history of tariff legislation in the United States; the present tariff system; the organization and work of the custom house; entry of goods. *II*; (3). Not given in 1914-15.

Prerequisite: Economics 29.]

31. **ORGANIZATION OF FOREIGN COMMERCE.**—Exporting and importing; means of communication and of transportation; the shipping business; duties of consuls. *II*; (3).

Prerequisite: Economics 28.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	31	3	—	9	—	9	—	9	—	206 Com.	Litman

33. **ECONOMICS OF INSURANCE.**—The historical development of insurance; its economic aspects. *II*; (2).

Prerequisite: Economics 1 and 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	33	2	—	—	9	—	9	—	—	206 Com.	Rietz

[34. **PROPERTY INSURANCE.**—Fire, marine, title, and credit insurance and corporate suretyship, etc. Their technical characteristics and economic effects. *I*; (2). Not given in 1914-15.

Prerequisite: Economics 1 and 3.]

37. **SALESMANSHIP.**—Policies and practise of modern sales organizations; selling problems of manufacturers, wholesalers, and retailers, and how they are being solved; management of salesmen; also a detailed study, with demonstrations of the practise of individual salesmen. *I*; (3).

Prerequisite: Economics 1 and 6. Open to students of business administration only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	37	3	—	3	—	3	—	3	—	307 Com.	McJohnston

38. **ADVERTISING.**—Principles and current practise of advertising; cooperation of advertising and personal selling; special problems; planning sales campaigns; choice of media; space buying; and practise in writing copy. *II*; (3).

Prerequisite: Economics 1 and 6. Open to students of business administration only.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	38	3	—	3	—	3	—	3	—	307 Com.	McJohnston

41. **RAILWAY TRANSPORTATION.**—Railway transportation in the United States, with passing reference to conditions abroad. Introduction; growth and present extent of the railway system; the relation of waterway and interurban competition to railway development; the railway corporation and its financial

aspects; the management of a railway; railway combinations; the theory and practise of rate-making; relations with state and federal governments; the relation of European railways to the state. *I*; (3).

Prerequisite: Economics 1 and 3; for engineers, Economics 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	41	3	—	10	—	10	—	10	—	210 Com.	Dewsnup

42. RAILWAY RATES: THEIR CONSTRUCTION AND REGULATION.—Rate structure of the United States; the policy of the Interstate Commerce Commission as shown by its decisions; the relation of such policy to the various theories of rate making. *II*; (3).

Prerequisite: Economics 41.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	42	3	—	10	—	10	—	10	—	210 Com.	Dewsnup

[43a-43b. THE THEORY AND PRACTISE OF RAILWAY TRAFFIC ADMINISTRATION.—The organization and methods of traffic management; problems connected therewith. Registration in the second semester is permitted only to those who obtain credit in the first semester. *I, II*; (2). Not given in 1914-15.

Prerequisite: Economics 1 and 3. Open to students of business administration only.]

45a-45b. RAILWAY OPERATION AND ITS PROBLEMS.—Organization of the operating department; economic problems of maintenance of way, and of motive power and equipment; the purchase of materials and their distribution; train movement; yard and terminal services. Registration in the second semester is permitted only to those who obtain credit in the work of the first semester. Open to students of business administration only. *I, II*; (2).

Prerequisite: Economics 1 and 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	45a	2	—	—	10	—	10	—	—	210 Com.	Dewsnup

SECOND SEMESTER

Economics	45b	2	Schedule the same as for 45a (first semester).								
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51. PUBLIC UTILITIES.—Relations of the public to public service corporations; methods of regulation, by franchises, sliding scales, municipal and state commissions; methods of control over accounting, capitalization, and service; development of the principles of valuation and rate making; comparisons of recent decisions of commissions; present tendencies in regulation. *I*; (3).

Prerequisite: Open to graduates and seniors who have had Economics 10.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	51	3	—	9	—	9	—	9	—	307 Com.	Heilman

COURSES FOR GRADUATES

Every student entering upon graduate work in economics must have had a thoro course in the principles of the science and should also have studied

EDUCATION

WILLIAM CHANDLER BAGLEY, Ph.D., *Professor*
 LOUIS DELTA COFFMAN, Ph.D., *Professor*
 CHARLES HUGHES JOHNSTON, Ph.D., *Professor*
 HORACE ADELBERT HOLLISTER, A.M., *Professor*
 GUY MONTROSE WHIPPLE, Ph.D., *Associate Professor*
 WILFORD STANTON MILLER, A.M., *Assistant and Secretary*
 JAMES HOWARD HANGER, A.M., *Assistant*
 MARGARET VARA COBB, A.M., *Assistant*

INTRODUCTORY COURSES

I. INTRODUCTION TO EDUCATION.—(a) A brief survey of the American public-school system; (b) an outline of the principles of education, involving a discussion of the aim of education; the biological basis, heredity, and environment; instinct, habit and habit-formation; memory, and the higher mental processes. (This course is by Senate ruling required of all students who wish to secure the official indorsement of the Appointments Committee for teaching positions in secondary schools.) *I or II.* (4).

Prerequisite: Junior standing.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Education	1	4	—	2	2	2	2	—	—	100 Com.	Bagley, Miller

SECOND SEMESTER

2	2	2	2	—	—	202 L. H.	Bagley, Miller
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2. HISTORY OF EDUCATION.—The development of educational theory and practise as related to the history of civilization; an outline course covering Greek, Roman, medieval, and modern education. Texts: Monroe's *Brief Course in the History of Education*; Anderson's *History of Common School Education*. *II*; (5).

Prerequisite: Two years of university work.

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Education	2	5	—	9	9	9	9	9	—	202 L. H.	Johnston

INTERMEDIATE COURSES

10. THE TECHNIQUE OF TEACHING.—Types of classroom exercises with practical work in the preparation of teaching plans; the hygiene of instruction; classroom management; the professional ethics of teaching. Observation of teaching in neighboring high schools is a feature of the course. (This course with Education 1 is by Senate ruling, required of all students who wish to secure the official recommendation of the Appointments Committee for teaching positions in secondary schools). *I or II*; (3).

Prerequisite: Education 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	10	3	—	—	3	—	3	—	—	202 L. H.	Bagley

SECOND SEMESTER

A	—	2	—	2	—	—	313 L. H.	Bagley
B	—	2	—	2	—	—	308 L. H.	Coffman
C	—	3	—	3	—	—	313 L. H.	Bagley

16. SOCIAL EDUCATION.—The school as a social factor in its relation to the home, the church, and the state; the relation of education to child labor, vocation, and crime; the school as a community center; the social composition of student—and teaching—populations; educational extension. *I*; (3).

Prerequisite: Two years of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	16	3	—	—	10	10	10	—	—	202 L. H.	Coffman

ADVANCED COURSES FOR GRADUATES AND UNDERGRADUATES

4. PROBLEMS OF EDUCATIONAL ADMINISTRATION.—The interpretation of present tendencies as exemplified in the school systems of typical cities and states, and in recent educational experiments in administration, discipline, and methods of teaching. *I*; (3).

Prerequisite: Education 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	4	3	—	11	11	11	—	—	—	113 L. H.	Coffman

5. COMPARATIVE EDUCATION.—A comparative study of the school systems of the United States, Germany, England, France, and Canada, with especial emphasis upon secondary schools. *I*; (3).

Prerequisite: Education 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	5	3	—	9	—	9	—	9	—	113 L. H.	Johnston

25. EDUCATIONAL PSYCHOLOGY.—An introductory course covering the following topics: instinct; habit and the acquisition of skill; perception and memory; conception, judgment, and reasoning. Lectures and demonstrations. *I*; (3).

Prerequisite: Psychology 1 or Education 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	25	3	—	9	—	9	—	9	—	(Arrange)	Whipple

6. PRINCIPLES OF HIGH-SCHOOL EDUCATION.—The evolution of high schools and of the fundamental conceptions of secondary education; the relationships of the high schools to the state systems; the legal status of the high school; its articulation with the elementary school, the college, the technical school, the community, and the home; the teaching staff; reorganization of curriculums; "controls" of construction; direction of student activities. *I*; (3).

Prerequisite: Education 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	6	3	—	10	—	10	—	10	—	113 L. H.	Johnston

27. HIGH-SCHOOL CURRICULUMS.—The fundamental bases of curriculum-making; principles of professional supervision; materials, text-books, and other teaching devices; the psychology of high-school branches of study; practical exercises in the framing of curriculums for typical communities. *II*; (3).

Prerequisite: Education 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	27	3	—	10	—	10	—	10	—	113 L. H.	Johnston

13-14. EDUCATIONAL CLASSICS.—A detailed study of the principal educational writings of Plato, Aristotle, Quintilian, Montaigne, Vittorino, Da Feltre, Milton, Locke, Comenius, Rousseau, Pestalozzi, Froebel, and Herbert Spencer. (This course is required of all candidates for advanced degrees in education). *I, II*; (3).

Prerequisite: Education 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	13	3	—	8	—	8	—	8	—	103 L. H.	Whipple

SECOND SEMESTER

Education	14	3	—	Schedule the same as for 13 (first semester).							
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15. SCHOOL HYGIENE.—The hygienic aspects of school architecture and equipment; the heating, ventilation, and lighting of school buildings; the hygiene of posture, exercise, and fatigue, and of reading and writing; the bearing of hygienic principles upon the program of studies and the daily time table; the mental health of teachers and pupils; contagious diseases and the relation of school authorities to health authorities. (Graduate credit subject to approval of Executive Faculty). *II*; (2).

Prerequisite: Education 1 (or normal-school graduation, or two years of teaching experience, with at least junior standing).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	15	2	—	—	3	—	3	—	—	(Arrange)	Whipple

18. METHOD IN EDUCATIONAL RESEARCH.—A study of statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees). *I*; (2).

Prerequisite: Education 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	18	2	—	—	2	—	2	—	—	113 L. H.	Coffman

20a. THEORY OF SUPERVISION.—The problems involved in the training of teachers in service; means and methods of measuring educational products; studies of qualities of merit in teachers and of causes of failure; factors involved in selecting teachers; organization of teachers' meetings and other agencies for improving the teaching service. *II*; (3).

Prerequisite: Education 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	20a	3	—	11	—	11	—	11	—	113 L. H.	Coffman

20b. THEORY AND PRACTISE OF SUPERVISION.—Identical with 20a except for the addition of a period each week devoted to the observation and criticism of teaching in elementary and high schools. *II*; (3).

Prerequisite: Education I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	20b	3	—	11	—	11	—	11	—	113 L. H.	Coffman

41. VOCATIONAL EDUCATION.—An examination of the institutions and methods of vocational education, particularly upon the elementary and secondary levels; federal, state, and municipal provisions for vocational education; recent legislation; present tendencies. *I*; (3).

Prerequisite: Education I (or an equivalent satisfactory to the instructor).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	41	3	—	3	—	3	—	—	—	113 L. H.	Johnston

42. AUXILIARY EDUCATION.—The institutions and methods involved in the training of defectives and delinquents; the Binet-Simon tests and other methods of mental diagnosis; educational treatment of morons and of moral delinquents; an outline of the methods of teaching sensory defectives (the blind and the deaf); public institutions of auxiliary education and their administration. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	42	3	—	3	—	3	—	3	—	(Arrange)	Whipple

COURSES FOR GRADUATES

101. SEMINAR IN EDUCATIONAL THEORY.—The general topic of the seminar in the fall of 1914 will be educational values, with especial emphasis upon programs, and the construction of school text-books with reference to the relative emphasis accorded to different topics treated. *I*; (1 unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	101	1 unit	—	—	4-6	—	—	—	—	103 L. H.	Bagley

[105. SEMINAR IN HISTORY OF EDUCATION.—(Not given in 1914-15.)]

106. SEMINAR IN SECONDARY EDUCATION.—Problems in the organization, administration, and special methods of secondary education; general supervision of special work in independent investigations by students prepared to do advanced work. *I*; (1 unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	106	1 unit	—	—	—	—	4-6	—	—	103 L. H.	Johnston

108. THE HISTORY OF VOCATIONAL AND INDUSTRIAL EDUCATION.—(To be omitted in 1915-16). *II*; (1 unit).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	108	1 unit	—							(Arrange)	—

104. SEMINAR IN ADMINISTRATION AND SUPERVISION.—Reading and discussion of technical monographs dealing with the various aspects of educational administration and supervision, the topics including school finance, retardation, measurement of educational products, educational surveys, the rating of teachers, etc. Each member will be expected to prepare a report upon some specific phase of administration. *Once a week. II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	104	1 unit	—	—	—	4-6	—	—	—	103 L. H.	Coffman

[III. PRACTISE TEACHING.—(Not given in 1914-15.)]

112. PRINCIPLES OF EDUCATION.—A course for graduate students who are not majoring in education and who have not taken undergraduate courses in education; the course involves: (a) a brief survey of the American public-school system; (2) a statement of the leading principles and doctrines of educational science; and (3) a brief reference to the technique of teaching and the problems of class management. *Twice a week. II; (½ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	112	½ unit	—	3	—	3	—	—	—	103 L. H.	Bagley

119. THE ELEMENTARY CURRICULUM.—The functions and values of elementary-school studies; time allotments; practical exercises in the construction of curriculums. *Three times a week. II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	119	1 unit	—	—	10	10	10	—	—	103 L. H.	Coffman

125. SEMINAR IN EDUCATIONAL PSYCHOLOGY.—The topic of the seminar for 1914-15 will be announced later. *Twice a week. I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	125	1 unit	—	—	—	4-6	—	—	—	103 L. H.	Whipple

DEPARTMENTAL CONFERENCE.—Every alternate Monday from 7 to 9 P. M. All graduate students majoring in education are expected to meet with the departmental staff at this time. The work carries no credit. *I, II.*

ELECTRICAL ENGINEERING

MORGAN BROOKS, Ph.B., M.E., *Professor*

ELLERY BURTON PAINE, M.S., E.E., *Associate Professor, Acting Head of Department*

EDWARD HARDENBERGH WALDO, A.B., M.S., M.E., *Assistant Professor*

PHILIP SHERIDAN BIEGLER, B.S., *Associate*

LEONARD VAUGHAN JAMES, M.S., E.E., *Associate*

IRA WILLIAM FISK, M.S., E.E., *Associate*

ABNER RICHARD KNIGHT, M.E., *Instructor*

*CHARLES RUBY MOORE, B.S., *Instructor*

4. ELECTRICAL ENGINEERING.—Electrical machinery; selection, installation and operation; distribution of power; motor applications, especially in mining. *II*; (2).

Prerequisite: Physics 1a-1b, 3a-3b; junior standing. (Mining engineers only admitted, except upon special permission of the E. E. Dept.)

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	4	2	—	9	—	9	—	—	—	206 E. E.	Brooks

5. ALTERNATING CURRENTS.—A mathematical and graphical treatment of the principles of periodic currents; theory of the simple phenomena in transmission lines and transformers. *II*; (4).

Prerequisite: Electrical Engineering 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	5	4	K	11	9,11	11	9,11	—	—	206 E. E.	Paine, James, Fisk
			L	10	9-11	10	9-11	—	—	207 E. E.	
			M	9	9	9	9	—	—	205 E. E.	
			N	9	9	9	9	—	—	203 E. E.	

6. ALTERNATING CURRENTS.—(For mechanical engineers.) *I*; (2).

Prerequisite: Electrical Engineering 25 or 16.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	6	2	P	10	—	10	—	—	—	207 E. E.	Brooks
			Q	11	—	11	—	—	—	206 E. E.	
			For Chemical Engineers								
				8	—	8	—	—	—	205 E. E.	

9. LIGHTING.—Electric lamps and other illuminants, and their effective use; interior wiring; methods of electrical distribution. (For architects.) *II* (half semester only); (1).

Prerequisite: Junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	9	1	—	10	—	—	—	10	—	221 E. H.	Brooks

14. ALTERNATING CURRENTS.—Alternating-current transformers and generators. *I*; (4).

Prerequisite: Electrical Engineering 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	4	4	K	8,10	10	8,10	—	10	—	206 E. E.	Paine, James, Fisk
			L	8,11	11	8,11	11	—	—	207 E. E.	
			M	8	8	8	8	—	—	205 E. E.	
			N	8	8	8	8	—	—	203 E. E.	

*Second Semester.

16. DYNAMO-ELECTRIC MACHINERY.—Direct-current generators; motors; distribution circuits; storage batteries. Laboratory practise. (To be discontinued after 1914-15. Given 1914-15 for chemical engineers only, except upon special permission of the E. E. Dept.) *II*; (4).

Prerequisite: Physics 1a-1b, 3a-3b; Mathematics 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	16	4	—	8	9-12	8	—	8	—	203 E. E.	} Brooks } Moore } Knight

17. ADVANCED ALTERNATING CURRENTS.—Synchronous, induction, and commutator alternating current motors; rotary converters; distributed inductance and capacity; transient phenomena. *II*; (4).

Prerequisite: Electrical Engineering 14, 24.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	17	4	K	8,10	10	8,10	—	10	—	206 E. E.	Paine James Fisk
			L	8,11	11	8,11	11	—	—	207 E. E.	
			M	8	8	8	8	—	—	205 E. E.	
			N	8	8	8	8	—	—	203 E. E.	

22. ELECTRICAL ENGINEERING LABORATORY.—Direct current laboratory accompanying Electrical Engineering 25. *I*; (2).

Prerequisite: Registration in Electrical Engineering 25.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	22	2	KLMN	—	8	—	—	—	—	200 E. E.	Biegler Knight
			K ₁	—	1-4	—	—	—	—	200 E. E.	
			K ₂	—	—	—	—	—	8-11	200 E. E.	
			L ₁	—	—	—	1-4	—	—	200 E. E.	
			L ₂	—	—	—	—	9-12	—	200 E. E.	
			M	—	—	1-4	—	—	—	200 E. E.	
			N	1-4	—	—	—	—	—	200 E. E.	

23. ELECTRICAL ENGINEERING LABORATORY.—Determination of the flux and E. M. F. waves of alternators. Alternating current circuits, instruments. *II*; (2).

Prerequisite: Electrical Engineering 25, 22; registration in Electrical Engineering 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	23	2	KLMN	—	8	—	—	—	—	200 E. E.	Biegler
			K ₁	—	1-4	—	—	—	—	200 E. E.	
			K ₂	—	—	—	—	—	8-11	200 E. E.	
			L ₁	—	—	—	1-4	—	—	200 E. E.	
			L ₂	—	—	—	—	1-4	—	200 E. E.	
			M	—	—	1-4	—	—	—	200 E. E.	
			N	1-4	—	—	—	—	—	200 E. E.	

24. ELECTRICAL ENGINEERING LABORATORY.—Advanced direct and alternating current testing. *I*; (2).

Prerequisite: Electrical Engineering 23; registration in Electrical Engineering 14.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	24	2	KL	—	8	—	—	—	—	200 E. E.	Biegler Moore
			K ₁	—	—	—	8-11	—	—	200 E. E.	
			K ₂	—	—	1-4	—	—	—	200 E. E.	
			L ₁	—	1-4	—	—	—	—	200 E. E.	
			L ₂	—	—	—	1-4	—	—	200 E. E.	
			MN	—	—	—	—	8	—	200 E. E.	
			M	1-4	—	—	—	—	—	200 E. E.	
			N	—	—	—	—	—	1-4	200 E. E.	

25. DYNAMO ELECTRICAL MACHINERY.—Laws of electric and magnetic circuits; construction and operation of direct current generators and motors. *I*; (4).

Prerequisite: Physics 1a-1b, 3a-3b; Mathematics 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	25	4	K	11	9,11	11	9,11	—	—	206 E. E.	Paine
			L	10	9-11	10	9-11	—	—	207 E. E.	James
			M	9	9	9	9	—	—	205 E. E.	Fisk
			N	9	9	9	9	—	—	203 E. E.	Knight

27. ELECTRICAL ENGINEERING LABORATORY.—Advanced alternating current testing. *II*; (2).

Prerequisite: Electrical Engineering 24; registration in Electrical Engineering 17.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	27	2	K	—	11	—	—	—	—	200 E. E.	Biegler Moore
			K ₁	—	—	—	9-12	—	—	200 E. E.	
			K ₂	—	—	1-4	—	—	—	200 E. E.	
			LMN	—	10	—	—	—	—	200 E. E.	
			L ₁	—	1-4	—	—	—	—	200 E. E.	
			L ₂	—	—	—	1-4	—	—	200 E. E.	
			M	1-4	—	—	—	—	—	200 E. E.	
			N	—	—	—	—	—	8-11	200 E. E.	

28. ELECTRICAL ENGINEERING LABORATORY.—Testing of dynamos and motors. (For students in municipal and sanitary engineering.) *I*; (1).

Prerequisite: Electrical Engineering 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	28	4	—	—	—	—	9-12	—	—	200 E. E.	Biegler

29. ELECTRICAL ENGINEERING LABORATORY.—Alternating current operation and testing. (For students in mechanical engineering.) *II*; (2).

Prerequisite: Electrical Engineering 6.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	29	2	PQ	—	—	—	1-4	1-4	—	200 E. E.	Moore

32. ELECTRICAL DESIGN.—Calculation and design of electromagnets and of dynamos, direct and alternating, and of transformers. *I*; (2).

Prerequisite: Electrical Engineering 5; registration in Electrical Engineering 14.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	32	2	KLMN	—	9	—	—	—	—	207 E. E.	Waldo. Knight
			K ₁	—	—	1-4	—	—	—	204 E. E.	
			K ₂	—	—	—	8-11	—	—	204 E. E.	
			L ₁	—	—	—	1-4	—	—	204 E. E.	
			L ₂	—	1-4	—	—	—	—	204 E. E.	
			M	—	—	—	—	—	8-11	204 E. E.	
			N	1-4	—	—	—	—	—	204 E. E.	

35. THESIS.—First semester, preliminary reading and investigation; second semester, completion. Subjects must be chosen and approved before the first Monday in November. *II*; (3). *Arrange*.

56. ELECTRICAL DESIGN.—Calculation of induction motors and converters. Problems in power plant design. *II*; (4).

Prerequisite: Electrical Engineering 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	56	4	KLMN	—	9	—	—	—	—	207 E. E.	Waldo, Knight
			K	—	—	8	—	8	—	205 E. E.	
			L	—	—	—	10	8	—	206 E. E.	
			M	—	—	—	9	8	—	205 E. E.	
			N	—	—	—	11	8	—	207 E. E.	
			K ₁	—	—	1-4	—	—	—	204 E. E.	
			K ₂	—	—	—	9-12	—	—	204 E. E.	
			L ₁	—	—	—	1-4	—	—	204 E. E.	
			L ₂	—	1-4	—	—	—	—	204 E. E.	
			M	—	—	—	—	—	8-11	204 E. E.	
			N	1-4	—	—	—	—	—	204 E. E.	

64. ELECTRICAL ENGINEERING LABORATORY.—Testing of dynamos and motors, with special attention to mining applications. (In 1914-15 for students in mining engineering only, except upon special permission of the E. E. Dept.) *II*; (1).

Prerequisite: Registration in E. E. 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	64	1	—	—	—	—	9-12	—	—	200 E. E.	Biegler,

71-72. ELECTRICAL ENGINEERING LABORATORY.—The construction of special apparatus or other work approved by the department. (Elective for juniors and seniors.) *I, II*; *(1 to 3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	71	*1 to 3	—	—	—	—	—	—	—	(Arrange)	Moore
SECOND SEMESTER											
E. E.	72	*1 to 3	—	—	—	—	—	—	—	(Arrange)	Moore

92. LIGHTING AND WIRING.—First half of semester same as E. E. 9. Further study of distribution, fusing, Underwriters' Rules, etc. Motors. (For architectural engineers.) *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	92	2	—	10	—	—	—	10	—	221 E. H.	Brooks

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

THE ENGLISH LANGUAGE AND LITERATURE

(Including RHETORIC)

DANIEL KILHAM DODGE, Ph.D., *Professor*
 THOMAS ARKLE CLARK, B.L., *Professor*
 STUART PRATT SHERMAN, Ph.D., *Professor, and Chairman*
 EDWARD FULTON, Ph.D., *Associate Professor*
 EDWARD CHAUNCEY BALDWIN, Ph.D., *Assistant Professor*
 HARRY GILBERT PAUL, Ph.D., *Assistant Professor*
 FRANKLIN WILLIAM SCOTT, Ph.D., *Assistant Professor, Secretary*
 HARRIE STUART VEDDER JONES, Ph.D., *Assistant Professor*
 JACOB ZEITLIN, Ph.D., *Associate*
 CHARLES HENRY WOOLBERT, A.M., *Associate*
 HERBERT LESOURD CREEK, Ph.D., *Associate*
 CLARENCE VALENTINE BOYER, Ph.D., *Associate*
 GERTRUDE SCHOEPFERLE, Ph.D., *Associate*
 MARTHA JACKSON KYLE, A.M., *Instructor*
 GEORGE FRISBIE WHICHER, A.M., *Instructor*
 CLARISSA RINAKER, Ph.D., *Instructor*
 EASLEY STEPHEN JONES, A.M., *Instructor*
 MERVIN JAMES CURL, A.M., *Instructor*
 HARRISON MCJOHNSTON, A.B., *Instructor*
 HAROLD M. HILLEBRAND, Ph.D., *Instructor*
 EARLE STANLEY ALDEN, A.M., *Instructor*
 ROBERT CALVIN WHITFORD, A.M., *Instructor*
 LYNN HAROLD HARRIS, Ph.D., *Instructor*
 RUSSELL OSBORNE STIDSTON, Ph.D., *Instructor*
 RALPH EARLE TIEJE, A.M., *Instructor*
 CARL SAWYER DOWNES, Ph.D., *Instructor*
 ROGER SHERMAN LOOMIS, A.M., B.Litt., *Tutor*
 SADA ANNIS HARBARGER, A.M., *Assistant*
 RUTH KELSO, A.M., *Assistant*
 WALTER ALBERT BUCHEN, A.M., *Assistant*
 LEW R. SARETT, A.B., *Assistant*
 EMERSON GRANT SUTCLIFFE, A.B., *Assistant*
 THOMAS BLAINE STANLEY, A.B., *Assistant*
 RAYMOND EPHRAIM DIXON, A.M., *Assistant*
 CLYDE BYRON BECK, A.B., *Assistant*
 _____ *Assistant*

Major

A student making English a major must take 20 hours in English in addition to Rhetoric I and the first semester of English I or English 10. These 20 hours must include at least 10 hours in English literature, at least 3 hours in composition, and at least 1 one-year course, or its equivalent, from the advanced group of courses.

A student must also take as one minor at least 20 hours in one foreign language, or in two foreign languages, or in one foreign language and philosophy, or in one foreign language and history.

Honors

Candidates for honors in English must offer:

1. Work in English amounting to 20 hours in addition to Rhetoric 1-2 and the first semester of English 1-2 or 10-11.
2. At least one one-year advanced course, which may be in either English literature or English composition.
3. A minimum of 15 hours in English literature in addition to the first semester of English 10-11, and a minimum of 5 hours in English composition in addition to Rhetoric 1-2.
4. Work aggregating 24 hours in two minor subjects, which must be in two foreign languages or in one foreign language and either history or philosophy. French 1a-1b and German 1 and 3 may not be counted toward the fulfillment of the minor requirements.

A. LITERATURE AND LANGUAGE

ELEMENTARY COURSES

1-2. SURVEY OF ENGLISH LITERATURE.—(Credit is not given for either semester separately, nor for the course in addition to course 10 or course 20. Only one semester's work is credited toward a major in English.) *I, II; (4).*

Prerequisite: A year's college work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	1	4	1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	Sherman
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ¹ Discussion	2	—	2	—	—	—	302 U. H.	Rinaker
			F ² Discussion	2	—	2	—	—	—	307 U. H.	Hillebrand
			F ³ Discussion	2	—	2	—	—	—	314 U. H.	Schoepperle
			N ¹ Discussion	—	11	—	11	—	—	307 U. H.	Baldwin
			N ² Discussion	—	11	—	11	—	—	308 U. H.	Buchen
			N ³ Discussion	—	11	—	11	—	—	314 U. H.	Hillebrand
			O ¹ Discussion	—	1	—	1	—	—	307 U. H.	Schoepperle

SECOND SEMESTER

English	2	4	1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	Sherman
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ¹ Discussion	2	—	2	—	—	—	302 U. H.	Rinaker
			F ² Discussion	2	—	2	—	—	—	314 U. H.	Hillebrand
			F ³ Discussion	2	—	2	—	—	—	308 U. H.	Creek
			N ¹ Discussion	—	11	—	11	—	—	307 U. H.	Baldwin
			N ² Discussion	—	11	—	11	—	—	314 U. H.	Buchen
			N ³ Discussion	—	11	—	11	—	—	302 U. H.	Hillebrand
			O ¹ Discussion	—	1	—	1	—	—	307 U. H.	Creek

10-11. INTRODUCTION TO LITERATURE.—10 (*First semester*), The Forms of Poetry. 11 (*Second semester*), The Forms of Prose Literature. (This course is intended only for those who expect to include a considerable amount of literature, in English or some other language, in their curriculum. Credit is not given for the course in addition to course 1 or course 20. Only one semester's work is credited toward a major in English. Credit is not given for the first semester separately.) *I, II; (3).*

Prerequisite: The minimum entrance requirements in English.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	10	3	A	8	—	8	—	8	—	302 U. H.	Paul
			B	9	—	9	—	9	—	302 U. H.	Dodge
			C	11	—	11	—	11	—	302 U. H.	Kyle

SECOND SEMESTER

English	11	3	A	8	—	8	—	8	—	302 U. H.	Zeitlin
			B	9	—	9	—	9	—	302 U. H.	—
			C	11	—	11	—	11	—	302 U. H.	Kyle

12-13. AMERICAN LITERATURE.—(Credit is not given for either semester separately.) *I, II; (2).*

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	12	2	—	—	1	—	1	—	—	418 U. H.	Paul

SECOND SEMESTER

English	13	2	—	Schedule the same as for 12 (first semester).							
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17. THE ENGLISH LANGUAGE.—Some account of its history, with special reference to the characteristics and usage of modern English. *I; (3).*

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	17	3	—	2	—	2	—	2	—	121 L. H.	Fulton

20. CHIEF ENGLISH WRITERS.—(This course is offered only for those whose program admits of but one semester's work in English, and who therefore may not register for course 1. It is not accepted, like course 1, as a prerequisite for more advanced courses. Credit is not given for the course in addition to course 1 or course 10.) *I or II; (4).*

Prerequisite: A year's college work.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	20	4	A	11	11	11	11	—	—	315 U. H.	Boyer
			B	3	3	3	3	—	—	315 U. H.	Boyer
			C	3	3	3	3	—	—	214 U. H.	Whicher

23. INTRODUCTION TO SHAKESPEARE.—*I or II; (3).*

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	23	3	—	2	—	2	—	2	—	315 U. H.	Sherman

SECOND SEMESTER

2	—	2	—	2	—	315 U. H.	—
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INTERMEDIATE COURSES

Prerequisite: Eleven hours of English literature, or eight hours of English literature and eight hours of a foreign language.

21-22. LITERARY STUDY OF THE BIBLE.—Hebrew literature as an expression of the life of the race that produced it; the debt, both ethical and artistic, of modern life to ancient Hebrew thought. (Either semester may be taken separately.) *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	21	3	—	10	—	10	—	10	—	307 U. H.	Baldwin

SECOND SEMESTER

English 22 3 — Schedule the same as for 21 (first semester).

24. ENGLISH LITERATURE OF THE VICTORIAN PERIOD.—*II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	24	3	—	11	—	11	—	11	—	308 U. H.	Kyle

29. ENGLISH LITERATURE FROM 1557 TO 1688, EXCLUSIVE OF THE DRAMA.—*I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	29	3	—	—	10	—	10	—	—	307 U. H.	Baldwin

31. ENGLISH LITERATURE FROM 1688 TO 1789.—*II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	31	3	—	—	11	—	11	—	—	110 L. H.	Paul

32. THE GREATER ENGLISH CRITICS OF THE 19TH CENTURY.—*II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	32	3	—	2	—	2	—	2	—	307 U. H.	Fulton

33. ENGLISH LITERATURE FROM 1789 TO 1837.—*I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	33	3	—	11	—	11	—	11	—	307 U. H.	Zeitlin

ADVANCED COURSES FOR UNDERGRADUATES AND GRADUATES

Prerequisite: Sixteen hours of English literature. These courses, however, are open to any junior or senior with the approval of the instructor concerned.

3. THE POETRY OF MILTON.—Origins, forms, artistic and ethical values; Milton's place in English literary history. *II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	3	3	—	—	10	—	10	—	—	110 L. H.	Baldwin

5. SHAKESPEARE.—Intensive study of a few plays, with special emphasis on *Hamlet*. *II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	5	3	—	9	—	9	—	9	—	110 L. H.	Dodge

25-26. CHAUCER AND HIS CONTEMPORARIES.—(The first semester, dealing with Chaucer exclusively, may be taken for separate credit.) *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	25	3	—	2	—	2	—	2	—	218 L. H.	Jones, H. S. V.

SECOND SEMESTER

English	26	3	—	Schedule the same as for 25 (first semester).							
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8-9. OLD ENGLISH (ANGLO-SAXON).—Grammar; prose; short poems; *Beowulf*. (The first semester may be taken separately.) *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	8	3	—	11	—	11	—	11	—	110 L. H.	Dodge

SECOND SEMESTER

English	9	3	—	Schedule the same as for 8 (first semester).							
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27-28. STUDIES IN THE HISTORY OF JOURNALISM.—*I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	27	2	—	—	2	—	2	—	—	211 L. H.	Scott

SECOND SEMESTER

English	28	2	—	Schedule the same as for 27 (first semester).							
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41-42. TEACHERS' COURSE.—Methods of teaching English literature and composition in the high school. (This course is not credited toward advanced degrees, or toward a major in English. Either semester may be taken separately.) *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	41	2	—	—	3	—	3	—	—	110 L. H.	Paul

SECOND SEMESTER

English	42	2	—	Schedule the same as for 41 (first semester).							
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18. MODERN ENGLISH GRAMMAR.—The structure of the sentence and its analysis into the parts of speech; the common grammatical categories; the peculiarities of English syntax. *II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	18	3	—	11	—	11	—	11	—	218 L. H.	Zeitlin

35-36. THE ENGLISH DRAMA (EXCLUSIVE OF SHAKESPEARE).—35 (*first semester*): from the beginning to 1600. 36 (*second semester*): from 1600 to 1700. (Either semester may be taken for separate credit.) *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	35	3	—	9	—	9	—	9	—	110 L. H.	Dodge

SECOND SEMESTER

English	36	3	—	2	—	2	—	2	—	110 L. H.	Sherman
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38. THE ARTHURIAN TRADITION IN ENGLAND.—Primitive elements; the historical Arthur; Celtic, French, and Italian influences; the tradition in England from the early romances to Arnold. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	38	3	—	10	—	10	—	10	—	218 L. H.	Schoepperle

39. INTRODUCTION TO THE LITERATURE OF THE MIDDLE AGES.—European culture, from the fourth century; the relation of English and continental literature, to the fourteenth century. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	39	3	—	10	—	10	—	10	—	110 L. H.	Creek

COURSES FOR GRADUATES

101. RESEARCH IN SPECIAL PERIODS.—Competent graduate students are encouraged to seek the advice and assistance of the department of English and to submit to the department plans for study in the language or literature of the periods mentioned below.

- A. Anglo-Saxon language and literature Professor DODGE, Dr. ZEITLIN
- B. Thirteenth and Fourteenth Centuries
Assistant Professor H. S. V. JONES
- C. Sixteenth Century Professor DODGE
- D. Seventeenth Century Assistant Professor BALDWIN
- E. Eighteenth Century Professor SHERMAN, Assistant Professor PAUL
- F. Nineteenth Century Professor SHERMAN, Associate Professor FULTON

108. THE ENGLISH EPIC.—The 16th, 17th, and 18th Centuries, from the point of view of classical theory. *Twice a week. I, II*; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	108	1 unit	—	—	11	—	11	—	—	218 L. H.	Fulton

109. GERMAN AND SCANDINAVIAN INFLUENCES ON ENGLISH LITERATURE OF THE EIGHTEENTH AND NINETEENTH CENTURIES.—*Twice a week. I*; (1 unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	109	1 unit	—							110 L. H.	Dodge
							(Arrange)				

110. OLD ENGLISH (ANGLO-SAXON) POETRY.—*Twice a week. I, II*; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	110	1 unit	—							110 L. H.	Dodge
							(Arrange)				

113. HISTORICAL PROSE SYNTAX.—The forces, native and foreign, at work in the development of English prose style as far as it relates to sentence structure. *Twice a week. I, II*; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	113	1 unit	—	—	9	—	9	—	—	218 L. H.	Zeitlin

126. ENGLISH BALLADS AND METRICAL ROMANCES.—*Twice a week. I, II. (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	126	1 unit	—	—	2	—	2	—	—	218 L. H.	Jones, H. S. V.

135. PROBLEMS IN AMERICAN LITERATURE.—*Twice a week. I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	135	1 unit	—	—	2	—	2	—	—	110 L. H.	Paul

137. NINETEENTH CENTURY PROSE WRITERS.—Studies in the relation of literature to social forces, with special attention to the works of Mill, Carlyle, Newman, Ruskin, Arnold, and Pater. *Twice a week. I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	137	1 unit	—	—	3	—	3	—	—	218 L. H.	Sherman

138. OLD IRISH.—Selections from the glosses and from the Táin bo Cualnge; lectures on Old and Middle Irish literature. *Twice a week. I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	138	1 unit	—	—	2	—	2	—	—	(Arrange)	Schoepperle

B. RHETORIC

ELEMENTARY COURSES

1-2. *RHETORIC AND THEMES.—Required for students in the Colleges of Liberal Arts and Sciences, Engineering, and Agriculture. *I, II; (3).*

Prerequisite: The minimum entrance requirements in English.

For the benefit of those whose course is irregular, a limited number of sections in each semester take up the work of the other semester. The course is not counted toward a major in English.

*Students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from the first semester's work. The examination for those desirous of meeting this qualification will be given at 7 p. m., September 21.

Students who show in the first two weeks that they are not prepared to do composition work of collegiate grade will be assigned to a special course parallel to Rhetoric 1, but involving additional work.

FIRST SEMESTER

(The following sections are open only to students of the College of Liberal Arts and Sciences, women students of the College of Agriculture, and Law students.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	A 1	8	—	8	—	8	—	419 U. H.	Downes
			A 2	8	—	8	—	8	—	314 U. H.	Warnock
			A 3	8	—	8	—	8	—	307 U. H.	Stanley
			B 1	9	—	9	—	9	—	307 U. H.	Stidston
			B 2	9	—	9	—	9	—	318 U. H.	Kelso
			B 3	9	—	9	—	9	—	315 U. H.	Hillebrand
			C 1	10	—	10	—	10	—	419 U. H.	Boyer
			C 2	10	—	10	—	10	—	302 U. H.	Zeitlin
			C 3	10	—	10	—	10	—	314 U. H.	Scott
			D 1	11	—	11	—	11	—	420 U. H.	Dixon
			D 2	11	—	11	—	11	—	214 U. H.	Creek
			D 3	11	—	11	—	11	—	314 U. H.	Downes
			E 1	1	—	1	—	1	—	308 U. H.	Jones, H.S.V.
			E 2	1	—	1	—	1	—	307 U. H.	Schoepperle
			F 1	2	—	2	—	2	—	419 U. H.	Beck
			F 2	2	—	2	—	2	—	418 U. H.	Jones, E.S.
			F 3	2	—	2	—	2	—	420 U. H.	Whicher
			G 1	3	—	3	—	3	—	302 U. H.	Fulton
			G 2	3	—	3	—	3	—	308 U. H.	Schoepperle
			K 1	—	8	—	8	—	8	314 U. H.	Alden
			M 1	—	10	—	10	—	10	308 U. H.	Rinaker

(The following sections are open only to Engineering students.)

A 4	8	—	8	—	8	—	105 T. B.	Sutcliffe
A 5	8	—	8	—	8	—	203 T. B.	Alden
B 4	9	—	9	—	9	—	203 T. B.	Alden
C 4	10	—	10	—	10	—	215 T. B.	Beck
D 4	11	—	11	—	11	—	215 T. B.	Harbarger
D 5	11	—	11	—	11	—	105 T. B.	Harris
E 4	1	—	1	—	1	—	105 T. B.	Jones, E. S.
E 5	1	—	1	—	1	—	215 T. B.	Stidston
K 4	—	8	—	8	—	8	203 T. B.	Harbarger
K 5	—	8	—	8	—	8	205 T. B.	Harris
K 6	—	8	—	8	—	8	204 T. B.	Whitford
L 4	—	9	—	9	—	9	215 T. B.	Whicher
L 5	—	9	—	9	—	9	204 T. B.	Tieje
M 4	—	10	—	10	—	10	215 T. B.	Buchen
N 4	—	11	—	11	—	11	215 T. B.	Tieje
N 5	—	11	—	11	—	11	417 U. H.	Whitford

(The following sections are open only to men students in the College of Agriculture.)

B 8	9	—	9	—	9	—	314 U. H.	Jones, E. S.
C 8	10	—	10	—	10	—	214 U. H.	Hillebrand
C 9	10	—	10	—	10	—	318 U. H.	Stidston
D 8	11	—	11	—	11	—	318 U. H.	Curl
F 8	2	—	2	—	2	—	308 U. H.	Kelso
F 9	2	—	2	—	2	—	512 U. H.	Harris
K 8	—	8	—	8	—	8	302 U. H.	Downes
L 8	—	9	—	9	—	9	314 U. H.	Whitford
M 8	—	10	—	10	—	10	211 U. H.	Dixon
N 8	—	11	—	11	—	11	420 U. H.	Rinaker

(Section Z below is for foreigners. Assignments are to be made by permission of Professor F. W. Scott.)

Z	4	—	4	—	4	—	420 U. H.	Creek
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Sections O 1 (8 T T S), O 2 (9 T T S), O 3 (10 M W F), and O 4 (11 M W F), are for students whose preparation proves after two weeks' trial in other sections to have been deficient. Assignments to these sections will be made by Prof. F. W. Scott. *No student will be permitted to register in these sections on the registration days.*

(The following sections of Rhetoric 2 (second semester Rhetoric) will be given during the first semester. These sections are open to students of all colleges who are irregular in course.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	K 1	—	8	—	8	—	8	419 U. H.	Stanley
			L 1	—	9	—	9	—	9	420 U. H.	Harbarger
			M 1	—	10	—	10	—	10	420 U. H.	Sutcliffe
			N 1	—	11	—	11	—	11	318 U. H.	Dixon

SECOND SEMESTER

(The following sections are open only to students of the College of Liberal Arts and Sciences, women students of the College of Agriculture, and Law students.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	A 1	8	—	8	—	8	—	419 U. H.	Downes
			A 2	8	—	8	—	8	—	314 U. H.	Warnock
			A 3	8	—	8	—	8	—	307 U. H.	Stanley
			B 1	9	—	9	—	9	—	307 U. H.	Stidston
			B 2	9	—	9	—	9	—	318 U. H.	Kelso
			C 1	10	—	10	—	10	—	419 U. H.	Boyer
			C 2	10	—	10	—	10	—	314 U. H.	Downes
			C 3	10	—	10	—	10	—	315 U. H.	Buchen
			D 1	11	—	11	—	11	—	420 U. H.	Dixon
			D 2	11	—	11	—	11	—	307 U. H.	Creek
			D 3	11	—	11	—	11	—	314 U. H.	Hillebrand
			E 1	1	—	1	—	1	—	308 U. H.	Jones, H.S.V.
			E 2	1	—	1	—	1	—	314 U. H.	Schoepperle
			F 1	2	—	2	—	2	—	419 U. H.	Beck
			F 2	2	—	2	—	2	—	420 U. H.	Jones, E. S.
			F 3	2	—	2	—	2	—	214 U. H.	Whicher
			G 1	3	—	3	—	3	—	308 U. H.	Fulton
			G 2	3	—	3	—	3	—	314 U. H.	Schoepperle
			K 1	—	8	—	8	—	8	308 U. H.	Alden
			M 1	—	10	—	10	—	10	302 U. H.	Rinaker

(The following sections are open only to engineering students.)

A 4	8	—	8	—	8	—	215 T. B.	Sutcliffe
A 5	8	—	8	—	8	—	203 T. B.	Alden
A 6	8	—	8	—	8	—	310 U. H.	Whitford
B 4	9	—	9	—	9	—	204 T. B.	Alden
B 5	9	—	9	—	9	—	215 T. B.	Harris
C 4	10	—	10	—	10	—	215 T. B.	Beck
D 4	11	—	11	—	11	—	204 T. B.	Harbarger
E 4	1	—	1	—	1	—	105 T. B.	Jones, E. S.
E 5	1	—	1	—	1	—	215 T. B.	Stidston
K 4	—	8	—	8	—	8	203 T. B.	Harbarger
K 5	—	8	—	8	—	8	215 T. B.	Harris
L 4	—	9	—	9	—	9	215 T. B.	Harris
L 5	—	9	—	9	—	9	204 T. B.	Tieje
M 4	—	10	—	10	—	10	215 T. B.	Buchen
N 4	—	11	—	11	—	11	215 T. B.	Tieje
N 5	—	11	—	11	—	11	417 U. H.	Whitford

(The following sections are open only to men students in the College of Agriculture.)

B 8	9	—	9	—	9	—	314 U. H.	Jones, E. S.
C 8	10	—	10	—	10	—	214 U. H.	Hillebrand
C 9	10	—	10	—	10	—	218 U. H.	Stidston
D 8	11	—	11	—	11	—	512 U. H.	Curl
F 8	2	—	2	—	2	—	512 U. H.	Harris
F 9	2	—	2	—	2	—	417 U. H.	Kelso
K 8	—	8	—	8	—	8	314 U. H.	Downes
L 8	—	9	—	9	—	9	314 U. H.	Whitford
M 8	—	10	—	10	—	10	308 U. H.	Dixon
N 8	—	11	—	11	—	11	420 U. H.	Rinaker

(Section Z below is for foreigners. Assignments are to be made by permission of Professor F. W. Scott.)

Section	M	T	W	T	F	S	Room	Instructor
Z	4	—	4	—	4	—	308 U. H.	Creek

(The following sections of Rhetoric 1 (first semester Rhetoric) will be given during the second semester.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	B	9	—	9	—	9	—	214 U. H.	Curl
			C	10	—	10	—	10	—	302 U. H.	Harbarger
			E	1	—	1	—	1	—	307 U. H.	Tieje
			G	3	—	3	—	3	—	419 U. H.	Kelso
			K	—	8	—	8	—	8	419 U. H.	Stanley
			L	—	9	—	9	—	9	420 U. H.	Dixon
			M	—	10	—	10	—	10	419 U. H.	Sutcliffe

INTERMEDIATE COURSES

3. ENGLISH COMPOSITION.—Short themes, with an occasional long theme. *I or II; (3).*

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	3	3	A	8	—	8	—	8	—	308 U. H.	Curl
			C	10	—	10	—	10	—	308 U. H.	Kyle

SECOND SEMESTER

A	8	—	8	—	8	—	308 U. H.	Curl
C	10	—	10	—	10	—	308 U. H.	Zeitlin

6. NARRATIVE COMPOSITION.—Practise in short story writing. (Intended for those who have some aptitude for literary work.) *I; (3).*

Prerequisite: Two years of college work and the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	6	3	—	10	—	10	—	10	—	218 L. H.	Curl

10. BUSINESS WRITING.—General business correspondence; practise in incidental writing, summaries, etc. Lectures, and discussions of the practise of the student in applying the principles presented in the course. (In the second semester open only to those taking a business course, except by special permission. Not counted toward a major in English.) *I or II; (2).*

Prerequisite: Rhetoric 1-2.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	10	2	A	—	8	—	8	—	—	312 Com.	McJohnston
			B	—	9	—	9	—	—	312 Com.	McJohnston

12-13. NEWSPAPER WRITING.—News writing; interviewing and reporting; news correspondence; news form; news value; typography; proof reading. *I, II; (3).*

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	12	3	—	—	2	—	2	—	—	324 U. H.	Buchen

SECOND SEMESTER

English 13 3 — Schedule the same as for 12 (first semester).

19. AGRICULTURAL NEWS WRITING.—Class exercises; lectures; assignments in gathering and preparing material for agricultural papers. *II*; (3).

Prerequisite: Junior or senior standing in the College of Agriculture; Rhetoric 1-2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	19	3	—	—	3	—	3	—	—	302 U. H.	Scott

21. SALES CORRESPONDENCE.—The economic and psychological principles underlying successful sales letter writing; planning the letter sales campaign; the form of the follow-up letter; analysis of markets, etc. *I*; (2).

Prerequisite: Rhetoric 10. Open to students in business administration only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	21	2	—	—	10	—	10	—	—	312 Com.	McJohnston

22. SUMMARIZING AND ABSTRACTING.—Summarizing, briefing, and making reports; abstracts of correspondence on file; summarizing of commercial and economic data. *II*; (2).

Prerequisite: Rhetoric 10. Open to students in business administration only.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	22	2	—	—	10	—	10	—	—	312 Com.	McJohnston

25-26. SENIOR CONFERENCES (BUSINESS COURSES).—Each senior will present to the instructor all the written papers presented during the year in his different courses for review and criticism by the instructor. Rewriting of such papers may be required if, in the opinion of the instructor, they are open to serious criticism. (Required of all seniors in the Courses in Business Administration.) *I, II*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	25	1	—	—	—	—	11	—	—	312 Com.	McJohnston

SECOND SEMESTER

Rhetoric 26 1 — Schedule the same as for 25 (first semester).

ADVANCED COURSES FOR UNDERGRADUATES AND GRADUATES

8. INTERPRETIVE READING.—(This course is intended for advanced students, particularly intending teachers. Credit is given only to students registered also in some advanced course in literature, such as English 3, 5, or 15. While open to graduate students, the course is not credited toward advanced degrees.) *II*; (1).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	8	1	—	—	2	—	2	—	—	214 U. H.	—

15-16. ADVANCED NEWSPAPER WRITING.—The larger problems in reporting; application of principles of history, economics, and political science to current public events; editing; editorial writing. *I, II; (3).*

Prerequisite: Rhetoric 12-13 or the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	15	3	—	2	—	2	—	2	—	324 U. H.	Scott

SECOND SEMESTER

Rhetoric	16	3	—	Schedule the same as for 15 (first semester).							
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17. ADVANCED COMPOSITION.—Practise writing, with special emphasis on the study of structure; criticism of current periodical literature; the developing of material for reports, magazine articles, etc. (Open to a limited number of students, and only on recommendation.) *II; (3).*

Prerequisite: Two years of college work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	17	3	—	10	—	10	—	10	—	110 L. H.	—

C. PUBLIC SPEAKING

1-2. ORAL EXPRESSION.—Theory and practise of elocution and platform manner; especial emphasis given to the needs of effective public address; secondary attention given to the study of the interpretation of literature, both forensic and dramatic. *I, II; (2).*

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	1	2	A	1	—	1	—	—	—	320 U. H.	Woolbert
			B	1	—	1	—	—	—	318 U. H.	Sarett
			C	1	—	1	—	—	—	410 U. H.	—
			D	—	1	—	1	—	—	318 U. H.	Sarett
			E	—	1	—	1	—	—	410 U. H.	—
			F	2	—	2	—	—	—	318 U. H.	Sarett
			G	—	2	—	2	—	—	318 U. H.	—
			H	—	3	—	3	—	—	318 U. H.	—

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	2	2	—	Schedule the same as for 1 (first semester).							

3-4. ARGUMENTATION AND DEBATE.—Theory and practise of argumentative discourse; especially aimed to train the student in the methods of meeting an opponent; a study of (1) methods of selecting and arranging material for forensic contests, (2) methods of attack and refutation, and (3) practise on the floor in actual debate. *I, II; (3).*

Prerequisite: Public Speaking 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	3	3	A	2	—	2	—	2	—	320 U. H.	Woolbert
			B	3	—	3	3	—	—	320 U. H.	Sarett

SECOND SEMESTER

Public Speaking	4	3	—	Sections and schedule the same as for 3 (first semester).
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5-6. THE FORMS OF PUBLIC ADDRESS.—Study and practise of the methods of composition and delivery applicable to the winning of various kinds of audiences; lectures on the psychology of persuasion, including (1) the sources of belief, (2) the steps necessary in inducing response, (3) the processes of analysis and synthesis, (4) the laws governing attention, interest, and impulse, and (5) the study of tendencies that actuate men as individuals and as crowds. *I, II; (2).*

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Public Speaking	5	2	—	—	2	—	2	—	—	320 U. H.	Woolbert

SECOND SEMESTER

Public Speaking	6	2	—	Schedule the same as for 5 (first semester).
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7-8. A STUDY OF ORATORS AND ORATORY.—The lives, times, and speeches of distinguished speakers; required readings and reports, both written and oral; discussions, topical speeches, and declamations. *I, II; (2).*

Prerequisite: Public Speaking 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	7	2	—	—	3	—	3	—	—	410 U. H.	Woolbert

SECOND SEMESTER

Public Speaking	8	2	—	Schedule the same as for 7 (first semester).
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ENTOMOLOGY

(See also BOTANY, PHYSIOLOGY, and ZOOLOGY.)

STEPHEN ALFRED FORBES, Ph.D., LL.D., *Professor*

ALEXANDER DYER MACGILLIVRAY, Ph.D., *Associate Professor*

JUSTUS WATSON FOLSOM, D.Sc., *Assistant Professor*

ROBERT DOUGLAS GLASGOW, Ph.D., *Instructor*

ALVAH PETERSON, A.M., *Assistant*

Entomology as taught at the University is distinctly differentiated from the work in zoology. Students preparing for service as economic entomologists should take as many of the courses offered as possible, including especially 2, 3, 4, 7, 8, 14, and 108. Those preparing for the teaching of zoology should take either 2 and 4, or 3 and 4, or all three of these courses.

1a-1b. ELEMENTARY ENTOMOLOGY.—Lectures; laboratory; field work. (Open to all students.) *I, II*; (2).

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Entomology	1a	2	—	—	1,2	—	1,2	—	—	408 N. H.	Folsom, Glasgow

SECOND SEMESTER

Entomology	1b	2	—	Schedule the same as for 1a (first semester).
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2. GENERAL ENTOMOLOGY.—Field entomology; morphological and physiological entomology; the collection and preservation of specimens; laboratory studies of typical insects; the recognition of adaptive structures and their utilities. (This course and course 3 form a year's work, covering the whole field. Either may be taken independently of the other.) *I*; (5).

Prerequisite: Entomology 1a-1b, or 4a-4b, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	2	5	—	10,11	10,11	10,11	10,11	10,11	—	405 N. H.	Folsom, Glasgow

3. GENERAL ENTOMOLOGY.—The classification and determination of insects; the study of life histories in the insectary and by field observation; the collection of information with respect to the ecological relations of insects. *II*; (5).

Prerequisite: Entomology 1a-1b, or 4a-4b, or equivalent.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	3	5	—	10,11	10,11	10,11	10,11	10,11	—	405 N. H.	Folsom, Glasgow

4a-4b. INTRODUCTION TO ECONOMIC ENTOMOLOGY.—Lectures; field work; laboratory. *Section A* for students of agriculture. *I*; first half; (3). *Section B*, for students of horticulture. *II*; second half; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	4a	3	A	8,9	—	8,9	—	8,9	—	408 N. H.	Folsom
			B	8,9	—	8,9	—	8,9	—	408 N. H.	Glasgow

SECOND SEMESTER

Entomology	4b	3	—	Sections and schedule the same as for 4a (first semester).							
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5. INTRODUCTION TO RESEARCH.—Preparation for thesis work. Library, language, manuscript, and advanced laboratory work on assigned topics. (A three-hour course for one semester is required as a preparation for entomological thesis work.) *I* or *II*; *(3 to 5).

Prerequisite: Entomology 2, 3; or 15, 7.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	5	*3 to 5	—							(Arrange)	Folsom

6a-6b. THESIS INVESTIGATION.—Subjects selected during the junior year. Three hours a day given to investigation, under the supervision of an instructor. during the senior year. *I*, *II*; (5).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	6a	5	—							(Arrange)	MacGillivray, Folsom

SECOND SEMESTER

Entomology	6b	5	—	Schedule the same as for 6a (first semester).							
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*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

7. SYSTEMATIC ENTOMOLOGY.—The external anatomy of insects; the terminology of the parts; identification of specimens representing as many as possible of the major groups. *I or II*; (5).

Prerequisite: Entomology 2, or 15.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	7	5	—							(Arrange)	MacGillivray

8a-8b. ADVANCED ECONOMIC ENTOMOLOGY.—Assigned problems. Field laboratory, insectary, library, and manuscript work, with practise in the special operations of economic entomology. (Intended primarily to prepare students for service as entomologists in experiment stations and other state and government positions. Agronomy 7 and Horticulture 1, 2, and 3 should also be taken as a part of this preparation.) *I, II*; (3).

Prerequisite: Entomology 4a-4b, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	8a	3	—	1,2	—	1,2	—	1,2	—	405 N. H.	Folsom, Glasgow

SECOND SEMESTER

Entomology	8b	3	—	Schedule the same as for 8a (first semester).							
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9. ADVANCED SYSTEMATIC ENTOMOLOGY.—The identification of the characters upon which genera and species are based. *I or II*; (5).

Prerequisite: Entomology 2 or 15, and 7.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	9	5	—							(Arrange)	MacGillivray

10. TAXONOMY OF IMMATURE INSECTS.—*I*; (5).

Prerequisite: Entomology 2 or 15, and 7.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	10	5	—							(Arrange)	MacGillivray

11. CLASSIFICATION OF THE COCCIDAE.—Methods of preparing scale insects for study, the identification of genera and species, and discussion of their morphology, metamorphosis and phylogeny. *II*; (5).

Prerequisite: Entomology 2 or 15, and 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	11	5	—							(Arrange)	MacGillivray

12a-12b. SEMINAR.—Reports and discussion upon assigned topics; presentation and discussion of contents of recent entomological publications, and of results of personal research. *I, II*; (1).

Prerequisite: One year of entomological work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	12a	1	—	4	—	—	—	—	—	405 N. H.	—

SECOND SEMESTER

Entomology	12b	1	—	4	—	—	—	—	—	405 N. H.	—
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13. MEDICAL ENTOMOLOGY.—Insects and the transmission of disease; methods of controlling such insects and preventing the disease due to them. (Primarily for advanced students preparing for medicine.) *I or II; (3).*

Prerequisite: Zoology 3, or its equivalent in microscopical technique.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	13	3	—							(Arrange)	Folsom

14. ADVANCED ECONOMIC ENTOMOLOGY.—Personal work under direction on assigned problems in economic entomology, intended to prepare advanced students for immediate service as state and government entomologists. Advantage will be taken of the operations and practical problems of the State Entomologist's office so far as available. *I or II, and six weeks of summer vacation.*

Prerequisite: Courses in elementary and advanced economic entomology, and in systematic entomology.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	14	—	—							(Arrange)	—

15. ELEMENTARY SYSTEMATIC ENTOMOLOGY.—Lectures on the characteristics of the orders, suborders, and more important families, illustrated by descriptions of the habits of representative species; field collections and laboratory studies on the anatomy and classification of insects. *I; (5).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	15	5	—	10	—	10	—	10	—	229 N. H.	MacGillivray

(Arrange time for laboratory)

16a-16b. APICULTURE.—The essentials of bee-keeping. Practical operations, laboratory observations and experiments, and collateral reading. *I, II; (1).*

NOTE.—16a and 16b may be taken separately. Both will be given each semester.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	16a	1	—	—	—	2,3	—	—	—	405 N. H.	Folsom

EITHER SEMESTER

Entomology	16b	1	—	Schedule the same as for 16a.							
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COURSES FOR GRADUATES

The prerequisite for graduate work in entomology is one year's work in biological courses, including an equivalent of either Zoology 1 or Entomology 1 or 4. Entrance upon major work in entomology requires the equivalent of Entomology 2 and 3.

Graduate students who have had at least one year of college work in biological courses may take for graduate credit any of the preceding courses except 1, 4, and 6. The following courses are open to graduate students only.

102. RESEARCH IN THE MORPHOLOGY AND EMBRYOLOGY OF INSECTS.—*Twice a week. I, II; (1 or 2 units).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	102	1 or 2 units	—							(Arrange)	Folsom

103. RESEARCH IN FAUNISTIC AND ECOLOGICAL ENTOMOLOGY.—*Once or twice a week; I, II; (1 or 2 units).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	103	1 or 2 units	—							(Arrange)	Forbes

107. SYSTEMATIC ENTOMOLOGY.—*Five times a week; I, II; (1 or 2 units).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	107	1 or 2 units	—							(Arrange)	MacGillivray

108. RESEARCH IN ECONOMIC ENTOMOLOGY.—*Once or twice a week; I, II; (1 or 2 units).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	108	1 or 2 units	—							(Arrange)	Forbes

109. RESEARCH IN SYSTEMATIC ENTOMOLOGY.—*Twice a week; I, II; (1 or 2 units).*

				BOTH SEMESTERS							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	109	1 or 2 units	—						(Arrange)		MacGillivray

GEOLOGY

(Including MINERALOGY, PALEONTOLOGY and PHYSICAL GEOGRAPHY.)

CHARLES WESLEY ROLFE, M.S., *Professor*

WILLIAM SHIRLEY BAYLEY, Ph.D., *Professor*

THOMAS EDMUND SAVAGE, Ph.D., *Assistant Professor*

JOHN LYON RICH, Ph.D., *Instructor*

CLARENCE SAMUEL ROSS, A.B., *Assistant*

MASON K. READ, A.B., *Assistant*

ARTHUR Q. LARSON, A.B., *Assistant*

HENRY METHUSALEM DUBOIS, A.M., *Assistant*

NOTE.—The courses offered by the department of geology are grouped as follows: A. Geology, courses 1-4, 12, 13a, 13b, 19, 21, 22, 26a, 26b; survey for students in geology, courses 9, 15, 16, 17, 105, 106, 107; B. Mineralogy, courses 5, 5a, 6, 7, 101, 102, 103; C. Physiography, courses 8, 10, 11, 14, 23, 24, 25, 124.

COURSES FOR UNDERGRADUATES

I. DYNAMIC AND STRUCTURAL GEOLOGY.—The agents and processes involved in the development of the earth's present features. Lectures; laboratory. *I; (5).*

Prerequisite: Chemistry I or an equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	1	5	—	8,9	8,9	8,9	8,9	8,9	—	249 N. H.	Rolfe

1a. HISTORICAL GEOLOGY.—The evolution of the earth and its life. Lectures; laboratory work, consisting largely of a study of a few of the more characteristic fossils from the various horizons. (Continuing course I and introducing courses 9 and 16.) *II*; (5).

Prerequisite: Geology I or 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	1a	5	—	8,9	8,9	8,9	8,9	8,9	—	249 N. H.	Savage, DuBois

2. ECONOMIC GEOLOGY.—The origin and manner of occurrence of minerals and rocks of economic importance, especially those found in North America. Lectures; laboratory. *II*; (3).

Prerequisite: Geology 5; 13a and 13b, or I and 1a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	2	3	—	3	—	3	—	3	—	247 N. H.	Bayley

3. GENERAL GEOLOGY.—Mineralogy; dynamic, historic, and economic geology; minerals; rocks; contour maps; fossils. Recitations; laboratory. (For students who wish to devote but one semester to geology.) *I or II*; (5). *Daily, with occasional trips on Saturday.*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	3	5	—	10,11	10,11	10,11	10,11	10,11	—	249 N. H.	Rolfe,

SECOND SEMESTER

8,9	8,9	8,9	8,9	8,9	—	247 N. H.	Rolfe
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4. THESIS COURSE.—Field or laboratory problems; complete reports under the direction of an instructor; maps, sections, and figures based on observations. *II*; (5).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	4	5	—							(Arrange)	Rolfe, Bayley, Savage

5. MINERALOGY.—The most common ores and minerals of scientific importance; crystallography; the characteristics of about 125 of the most important minerals; blow pipe analysis. Lectures; laboratory. *I*; (5).

Prerequisite: Chemistry 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	5	5	—	8,9	8,9	8,9	8,9	8,9	—	247 N. H.	Bayley, Ross

5a. MINERALOGY.—Lectures and laboratory; the characteristics, origin, and transformation of the silicates. *II*; (3).

Prerequisite: Geology 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	5a	3	—							134 N. H.	Bayley, Ross

8. **PHYSIOGRAPHY OF EUROPE.**—Explanatory treatment of the physiographic features of the continent of Europe; climate; resources; the influence of geographic factors on industries, distribution of population, etc. *II*; (3).

Prerequisite: Geology 23 and 14.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	8	3	—	1,2	—	1,2	—	1,2	—	247 N. H.	Rich, Read

10. **PHYSIOGRAPHY OF SOUTH AND CENTRAL AMERICA.**—A regional study of South and Central America: physiography, climate; resources. *II*; (3).

Prerequisite: Geology 23 and 14.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	10	3	—	10,11	—	10,11	—	10,11	—	252 N. H.	Rich

11. **PHYSIOGRAPHY OF NORTH AMERICA.**—A study of typical physiographic provinces of North America, with especial emphasis on the United States. Lectures, readings, and maps. *I*; (3).

Prerequisite: Geology 23 and 14.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	11	3	—	10,11	—	10,11	—	10,11	—	252 N. H.	Rich, Read

12. **GEOLOGY OF SOILS.**—The origin of the various classes of soils; mineral compositions; physical characteristics; transformations. (Particularly valuable to students of agriculture and all those who are especially interested in plant growth.) *II*; (5).

Prerequisite: Chemistry I or an equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	12	5	—	1,2	1,2	1,2	1,2	1,2	—	247 N. H.	Rolfe

13a. **ENGINEERING GEOLOGY.**—Mineralogy and lithology. Open only to students in Engineering and Ceramics. Lectures; laboratory. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13a	3	—	10,11	—	10,11	—	10,11	—	247 N. H.	Bayley, Ross

13b. **ENGINEERING GEOLOGY.**—Dynamic and structural geology. Open only to students in Engineering and Ceramics. Lectures; laboratory. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13b	3	—	10,11	—	10,11	—	10,11	—	247 N. H.	Bayley, Ross

14. **METEOROLOGY.**—The heating and cooling, pressure, circulation, and moisture of the atmosphere; storms, and storm and weather forecasting; rainfall, climate. (Course 14 should be taken by all those who intend to do more than

the most elementary work in geography, and should be taken with Economics 26 by students of commerce. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	14	3	—	1,2	—	1,2	—	1,2	—	249 N. H.	Rich, Read

[19. FIELD GEOLOGY.—Not given in 1914-1915.]

21. GEOLOGY OF COAL.—The origin of coal; age, distribution and stratigraphy of the coal deposits of North America, with special emphasis on the Illinois or Eastern Interior basin. *I*; (2).

Prerequisite: Geology 13b or an equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	21	2	—					(Arrange)		254 N. H.	Savage

22. ORGANIC EVOLUTION.—The evolution of plant and animal forms as indicated by the fossil record. *II*; (3).

Prerequisite: Geology 1a, or one semester of zoology or botany.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	22	3	—	10	—	10	—	10	—	249 N. H.	Savage

23. PHYSIOGRAPHY OF THE LANDS.—A systematic study of land forms; origin, development, and classification; the relation between surface forms and rock composition and structure; the influence of climate on land forms. This course follows Geology 3 and presupposes a knowledge of the principal geologic processes. *II*; (5).

Prerequisite: Geology 3 or 13a and 13b or 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	23	5	—	8,9	8,9	8,9	8,9	8,9	—	252 N. H.	Rich, Read

24. PHYSIOGRAPHIC INTERPRETATIONS.—An introduction to the application of physiographic principles to the interpretation of recent earth history; erosion planes and their meaning; drainage modifications; physiographic indications of climatic fluctuations. This course naturally follows Geology 23, but requires in addition a knowledge of stratigraphic geology. *I*; (3).

Prerequisite: Geology 23 and 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	24	3	—	8,9	—	8,9	—	8,9	—	252 N. H.	Read

26a-26b. SEMINAR.—Weekly meetings, reports, and discussions of the current literature of geology, mineralogy, and physiography. Tho open to all students registered now or previously in the department, credit will be given only to those having 10 hours of completed work in the department of geology. *I*, *II*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	26a	1	—					(Arrange)		249 N. H.	Rolfe, Bayley, Savage, Rich

SECOND SEMESTER

Geology	26b	1	—	Schedule the same as for 26a (first semester).							
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SURVEYING FOR GEOLOGICAL STUDENTS.—I; (3). (See Civil Engineering 33).

TOPOGRAPHICAL SURVEYING FOR GEOLOGICAL STUDENTS.—II; (3). (See Civil Engineering 34).

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

6. PHYSICAL AND OPTICAL MINERALOGY.—An introduction to the courses in petrography. The physical and optical properties of minerals are discussed with special reference to symmetry. The larger portion of the work is devoted to the study of polarized light and its practical use in identifying the rock-forming materials. I; (3).

Prerequisite: Geology 5, 5a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	6	3	—					(Arrange)		134 N. H.	Bayley

7. PETROGRAPHY.—The principles learned in course 6 are applied to the study of rocks. Lectures describe the different types of rocks and discuss their origin and classification. In the laboratory a representative suite of specimens is studied in the hand specimen and thin section. II; (3).

Prerequisite: Geology 6.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	7	3	—	—	—	—	—	—	—	134 N. H.	Bayley

9. PALEONTOLOGY.—A study of invertebrate fossils, their classification and relationships. Instruction is given in the identification of the fossils, and in the finding and use of the literature of the subject. I; (5).

Prerequisite: Geology 1a; recommended: 1 year of botany or zoology.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	9	5	—	8,9	8,9	8,9	8,9	8,9	—	254 N. H.	Savage

15. STRUCTURAL GEOLOGY.—The arrangement of the rocks which form the earth's crust and their distribution on its surface; mountains; faults; folds; other diastrophic phenomena. I; (3).

Prerequisite: Geology 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	15	3	—	2	—	2	—	2	—	247 N. H.	Bayley

16. STRATIGRAPHY.—This course follows course 9, and is a study of principles of classifications, of rock formations, of the methods and criteria em-

103. THE CRYSTALLINE SCHISTS AND OTHER METAMORPHIC ROCKS.—Processes of Metamorphism. Lectures; laboratory. *Twice a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
Geology	103	1 unit	—						(Arrange)	Bayley

105. INVERTEBRATE PALEONTOLOGY.—A course devoted to the study of a group of invertebrate fossils, or of the fossils of a special geological system; their geographic distribution and geologic range with reference to stratigraphy. Largely individual work. *One to three times a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
Geology	105	1 unit	—						(Arrange)	Savage

106. AREAL AND STRATIGRAPHIC GEOLOGY.—Consists of a systematic study of the geology and paleontology of a selected area in Illinois. A carefully prepared report on the geology of the region, based on the data collected in the field, is required. *One to three times a week; I, II; (1-2 units).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
Geology	106	1-2 units	—						(Arrange)	Savage

107. AREAL AND STRUCTURAL GEOLOGY.—Individual work on some area exhibiting important structural or economic features. *Once a week; I, II; (2 units).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
Geology	107	2 units	—						(Arrange)	Bayley

124. ADVANCED PHYSIOGRAPHY.—Individual work on field problems; study and discussion of the literature of physiography and geomorphology. *One to three times a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
Geology	124	1 unit	—						(Arrange)	Rich

GERMANIC LANGUAGES AND LITERATURE

(Including COMPARATIVE PHILOLOGY and SCANDINAVIAN.)

JULIUS GOEBEL, Ph.D., *Professor*

OTTO EDUARD LESSING, Ph.D., *Professor*

GEORGE TOBIAS FLOM, Ph.D., *Associate Professor, Scandinavian*

GEORGE HENRY MEYER, A.M., *Assistant Professor*

NEIL CONWELL BROOKS, Ph.D., *Assistant Professor*

LEONARD BLOOMFIELD, Ph.D., *Assistant Professor, Comparative Philology*

DAISY LUANA BLAISDELL, A.M., *Instructor*

CHARLES MARSHALL POOR, Ph.D., *Instructor*

CHARLES ALLYN WILLIAMS, Ph.D., *Instructor*

ARMIN HAJAMAN KOLLER, Ph.D., *Instructor*

PHILIP STEPHAN BARTO, Ph.D., *Instructor*

ALEXANDER GREEN, Ph.D., *Instructor*

ADOLF EDUARD ZUCKER, A.M., *Assistant*

A. GERMAN

Honors

Candidates for honors in German must offer:

1. A minor of at least 12 hours in some other language; if this be English it must be exclusive of English 1 and work in Rhetoric; if it be French or Spanish it must be exclusive of the first year's work.

2. A minor of at least 12 hours in any one of the other humanities, provided that the courses chosen contribute in a reasonable degree to the student's knowledge of European civilization. In order to be sure that the work offered will be accepted as fulfilling this general purpose, students are urged to consult with the department in planning their work in their minor subjects.

3. A general knowledge of European history, such as is gained from History 1, or an equivalent course.

4. An acceptable thesis; it may be one written in connection with some course.

FIRST-YEAR COURSES

1. ELEMENTARY COURSE.—Grammar and easy reading for beginners. (One section is offered in the second semester for students who enter the University in the second semester.) *I*; (4).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	1	4	A	—	8	8	8	8	—	312 U. H.	Bloomfield
			B	—	9	9	9	9	—	212 U. H.	Brooks
			C	—	10	10	10	10	—	310 U. H.	Meyer
			D	—	11	11	11	11	—	210 U. H.	Williams
			E	1	1	1	1	—	—	312 U. H.	Blaisdell
			F	2	2	2	2	—	—	310 U. H.	Williams
			G	3	3	3	3	—	—	312 U. H.	Barto
			(For Students in Engineering)								
			H	—	11	11	11	11	—	311 U. H.	Poor
I	2	2	2	2	—	—	210 U. H.	Barto			

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	1	4	—	—	8	8	8	8	—	210 U. H.	Green

2. NARRATIVE AND DESCRIPTIVE PROSE.—Grammar and reading. *I*; (4).

Prerequisite: One year of high school German or German S 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	2	4	A	1	1	1	1	—	—	210 U. H.	Green
			B	3	3	3	3	—	—	210 U. H.	Poor
			C	3	3	3	3	—	—	311 U. H.	Koller

3. NARRATIVE AND DESCRIPTIVE PROSE.—Grammar and reading. (Continuation of German 1.) *II*; (4).

Prerequisite: German 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	3	4	A	—	8	8	8	8	—	312 U. H.	Bloomfield
			B	—	9	9	9	9	—	212 U. H.	Brooks
			C	—	10	10	10	10	—	310 U. H.	Meyer
			D	—	11	11	11	11	—	210 U. H.	Williams
			E	1	1	1	1	—	—	312 U. H.	Blaisdell
			G	3	3	3	3	—	—	312 U. H.	Barto

(For Students in Engineering)

H	—	11	11	11	11	—	—	311 U. H.	Poor
I	2	2	2	2	—	—	—	310 U. H.	Barto

SECOND-YEAR COURSES

4. DESCRIPTIVE AND HISTORICAL PROSE.—Selections from standard prose writers; sight reading; prose composition. *I or II*; (4).

Prerequisite: German 2, or 3, or two years of high school German.

FIRST SEMESTER

NOTE.—Sections E and I are *honor sections* to which students are admitted only by special permission from the department.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	4	4	A	—	8	8	8	8	—	310 U. H.	Williams
			B	—	8	8	8	8	—	210 U. H.	Zucker
			C	—	9	9	9	9	—	311 U. H.	Blaisdell
			D	—	10	10	10	10	—	210 U. H.	Poor
			*E	—	11	11	11	11	—	312 U. H.	Blaisdell
			F	—	11	11	11	11	—	212 U. H.	Barto
			G	1	1	1	1	—	—	310 U. H.	Williams
			H	1	1	1	1	—	—	311 U. H.	Zucker
			*I	2	2	2	2	—	—	212 U. H.	Koller
			J	2	2	2	2	—	—	312 U. H.	Green

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
			A	1	1	1	1	—	—	210 U. H.	Green
			B	3	3	3	3	—	—	310 U. H.	Poor
			C	3	3	3	3	—	—	212 U. H.	Koller

5. INTRODUCTION TO THE CLASSICS.—Schiller's *Jungfrau von Orleans*; Goethe's *Hermann und Dorothea*; or others of the classics. Prose composition. *I or II*; (4).

Prerequisite: German 4, or three years of high school German.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	5	4	A	—	10	10	10	10	—	311 U. H.	Green
			B	—	11	11	11	11	—	205 L. H.	Koller

SECOND SEMESTER

NOTE.—Sections E and I are *honor sections* to which students are admitted only by special permission from the department.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
			C	—	9	9	9	9	—	311 U. H.	Blaisdell
			D	—	10	10	10	10	—	210 U. H.	Poor
			*E	—	11	11	11	11	—	312 U. H.	Blaisdell
			G	1	1	1	1	—	—	311 U. H.	Williams
			*I	2	2	2	2	—	—	212 U. H.	Koller

*Honor section to which students are admitted only by special permission from the department.

6. SCIENTIFIC PROSE.—The rapid reading of works of a general scientific character. (Parallel with 5. Students may not take both 5 and 6 for more than a total of four hours' credit without special permission of department.) II; (4).

Prerequisite: German 4, or three years of high school German.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	6	4	F	—	11	11	11	11	—	212 U. H.	Baro
			H	1	1	1	1	—	—	310 U. H.	Zucker
			J	2	2	2	2	—	—	210 U. H.	Green

12. NEWSPAPER READING.—Daily reading of newspapers. Oral and written composition based upon the reading. Conversation. (Parallel with 5 and 6. Not open to students who have had 5 or 6 or any more advanced course.) II; (4).

Prerequisite: German 4 or three years of high school German, and the consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	12	4	—	—	8	8	8	8	—	310 U. H.	Zucker

THIRD-YEAR COURSES

NOTE.—Not more than ten hours of these courses may be counted towards a major without the approval of the department.

7. MODERN FICTION.—(Intended primarily for students who take 5 in the first semester. Not open to those who have had any course more advanced than 5.) II; (3).

Prerequisite: German 5, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	7	3	A	10	—	10	—	10	—	311 U. H.	Green
			B	11	—	11	—	11	—	205 L. H.	Koller

10. INTRODUCTORY GOETHE COURSE.—Reading of works illustrating different periods in Goethe's development: *Gotz von Berlichingen*; *Egmont*; *Iphigenie auf Tauris*; selections from *Dichtung und Wahrheit*. II; (3).

Prerequisite: German 14, or 16, or 24, or 28a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	10	3	A	10	—	10	—	10	—	212 U. H.	Brooks
			B	11	—	11	—	11	—	310 U. H.	Meyer

14. INTRODUCTORY SCHILLER COURSE.—Reading of works illustrating different periods in Schiller's development: Lyrics and Ballads; *Kabale und Liebe*; *Braut von Messina*. I; (3).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	14	3	—	10	—	10	—	10	—	212 U. H.	Brooks

16. ELEMENTARY PROSE COMPOSITION.—*I* or *II*; (2).*Prerequisite*: German 5, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	16	2	A	—	9	—	9	—	—	312 U. H.	Bloomfield
			B	—	9	—	9	—	—	210 U. H.	Green
			C	—	2	—	2	—	—	311 U. H.	Poor
SECOND SEMESTER											
				—	2	—	2	—	—	311 U. H.	Williams

17. INTERMEDIATE PROSE COMPOSITION.—*II*; (3).*Prerequisite*: German 16.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	17	3	A	9	—	9	—	9	—	312 U. H.	Bloomfield
			C	2	—	2	—	2	—	311 U. H.	Poor

24. MODERN DRAMA.—Rapid reading of dramas by Grillparzer, Hebbel, Hauptmann, and others. *I*; (3).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	24	3	—	2	—	2	—	2	—	311 U. H.	Blaisdell

28a-28b. GERMAN LYRICS.—The form, development, and different types of the lyric. The chief lyric poets of the classical period. (Not open to freshmen.) *I, II*; (2).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	28a	2	—	—	11	—	11	—	—	310 U. H.	Meyer
SECOND SEMESTER											
German	28b	2	—	Schedule same as 28a (first semester).							

PRIMARILY FOURTH-YEAR COURSES

NOTE.—Courses 11, 19, 26, 29, and 31 are especially recommended to all candidates for graduate scholarships in German; these same courses, together with 25, are recommended to seniors who expect to teach German.

8. SCHILLER.—The life of Schiller; *Wallenstein* and other selections. *II*; (3).

Prerequisite: Three years of college German, or equivalent.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	8	3	—	2	—	2	—	2	—	205 L. H.	Lessing

11. GERMAN LITERATURE AFTER THE REFORMATION.—Lectures; recitations; reports on assigned collateral reading. *II*; (3).

Prerequisite: German 26.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	11	3	—	3	—	3	—	3	—	205 L. H.	Lessing

[19a-19b. *GOETHE'S FAUST*.—The Faust legend and early Faust books and plays; the genesis of Goethe's *Faust*; reading of both parts. Not given 1914-15. *I, II*; (2).]

25. *TEACHERS' COURSE*.—Discussion of methods; examination of text-books. (Open to seniors and special students who have 20 hours' credit in German.) *II*; (2).

Prerequisite: German 29a or equivalent; completion of or registration in Education I or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	25	2	—	—	2	—	2	—	—	215 L. H.	Blaisdell

26. *GERMAN LITERATURE TO THE END OF THE REFORMATION*.—Lectures, recitations; reports on assigned reading. *I*; (3).

Prerequisite: German 10, or 24, or 28.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	26	3	—	3	—	3	—	3	—	205 L. H.	Lessing

27. *LESSING*.—The life of Lessing; *Nathan der Weise*; *Emilia Galotti*, and other selections. *I*; (3).

Prerequisite: Three years of college German, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	27	3	—	2	—	2	—	2	—	205 L. H.	Lessing

29a-29b. *ADVANCED PROSE COMPOSITION*.—Themes on Germany and German life, based on suitable reading, discussed in German. *I, II*; (3).

Prerequisite: German 17.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	29a	3	—	1	—	1	—	1	—	212 U. H.	Koller

SECOND SEMESTER

German	29b	3	—	Schedule the same as for 29a (first semester).							
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30a-30b. *THESIS COURSE*.—(Intended primarily for candidates for honors in German, but open to other seniors. *I, II*; *(1 or 2).

Prerequisite: Senior standing in College, and three years of college German or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	30a	*1 or 2	—							(Arrange)	Goebel Lessing Meyer Brooks Bloomfield

SECOND SEMESTER

German	30b	*1 or 2	—							(Arrange)
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*In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2.5, but 2, or 3, or 4, or 5.

31. MIDDLE HIGH GERMAN.—I; (2).

Prerequisite: Senior or graduate standing; three years of college German.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	31	2	—	10	—	10	—	—	—	215 L. H.	Goebel

[32. HISTORY OF GERMAN CIVILIZATION.—Readings; lectures; discussions. Not given, 1914-15. I; (3).]

39a-39b. GOETHE AND SCHILLER.—Interpretation of Goethe's poems. Goethe's *Tasso*; Schiller's *Ueber naive und sentimentalische Dichtung*. I, II; (2).

Prerequisite: Three years of college German; for the second semester, German 39a or the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	39a	2	—	—	11	—	11	—	—	215 L. H.	Goebel

SECOND SEMESTER

German	39b	2	—	Schedule the same as for 39a (first semester).							
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COURSES FOR GRADUATES

Students desiring to take German as a major are expected to have completed a four years' course of undergraduate study in German, corresponding to the four years' course at this University. They are expected to be familiar with the principal works of the writers of the classical and modern periods of German literature, to show a general knowledge of the history of German literature, and to be able to follow lectures in the German language.

Of collateral subjects, a reading knowledge of Latin and French is required. It is desirable that candidates for the degree of Ph.D. have some knowledge of Greek. All students are expected to have had a course in German history.

101. SEMINAR IN GERMANIC PHILOLOGY.—Training in original research; results of special value may be published in the *Journal of English and Germanic Philology*. *Once a week; I, II; (1 unit)*.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	101	1 unit	—	10	—	—	—	—	—	203-A L. H.	Goebel

[103. INTRODUCTION TO THE HISTORICAL STUDY OF THE GERMANIC LANGUAGES.—History of German Philology; comparative grammar of the Old Germanic dialects. Lectures; discussions of special topics. Not given, 1914-15. *Twice a week; II; (1 unit)*.]

104. GOTHIC.—Grammar and literature. *Twice a week; I; (1 unit)*.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	104	1 unit	—	—	10	—	10	—	—	215 L. H.	Goebel

105. OLD HIGH GERMAN.—Grammar and interpretation of the oldest literary documents. *Three times a week; II; (1 unit)*.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	105	1 unit	—	9	—	9	—	9	—	215 L. H.	Williams

109. GOETHE'S AND SCHILLER'S PHILOSOPHY.—*Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	109	1 unit	—	—	—	11	—	11	—	215 L. H.	Goebel

110. EARLY GERMAN DRAMA.—German drama up to the Reformation; medieval religious drama; Shrovetide plays; beginnings of the humanistic drama. *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	110	—	—	3	—	3	—	—	—	215 L. H.	Brooks

113. GERMAN LITERATURE OF THE FIFTEENTH AND SIXTEENTH CENTURIES.—Survey of the literature on the back-ground of the general history of the time; Luther and the Reformation; Mastersingers and folksong; the Reformation drama; Hans Sachs; Brant; Fischart; the chap books; the English comedians. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	113	1 unit	—	3	—	3	—	—	—	315 L. H.	Brooks

115. HISTORY OF GERMAN LITERATURE FROM GOETHE'S DEATH TO THE PRESENT TIME.—*Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	115	1 unit	—	—	2	—	2	—	—	205 L. H.	Lessing

[116. MEDIEVAL GERMAN LITERATURE WITH REFERENCE TO THE POLITICAL, RELIGIOUS, AND SOCIAL HISTORY.—Research. *Twice a week; I; (1 unit).* Not given, 1914-15.]

[117. HISTORY OF GERMAN LITERATURE DURING THE EIGHTEENTH CENTURY.—*Twice a week; I, II; (1 unit).* Not given, 1914-15.]

118. THE GERMAN DRAMA SINCE SCHILLER.—Research. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	118	1 unit	—	—	3	—	3	—	—	205 L. H.	Lessing

[119. THE GERMAN NOVEL.—Research. *Twice a week; I, II; (1 unit).* Not given, 1914-15.]

121b. GUDRUN.—Lectures and interpretations. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	121b	1 unit	—	—	—	10	—	10	—	215 L. H.	Goebel

B. COMPARATIVE PHILOLOGY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

1. INTRODUCTION TO THE STUDY OF LANGUAGES.—Phonetics; the development of forms of speech; dialects and the spread of languages; the study and teaching of language. *I*; (3).

Prerequisite: The consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Comparative Philology	1	3	—	9	—	9	—	9	—	205 L. H.	Bloomfield

2. COMPARATIVE PHILOLOGY OF THE INDO-EUROPEAN LANGUAGES.—Attention will be given chiefly to Greek, Latin, and the Germanic languages, including English. *II*; (2).

Prerequisite: The consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Comparative Philology	2	2	—	—	9	—	9	—	—	215 L. H.	Bloomfield

3. ELEMENTARY SANSKRIT.—Reading and grammar. *I*; (3).

Prerequisite: The consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Comparative Philology	3	3	—	10	—	10	—	10	—	205 L. H.	Bloomfield

4. ELEMENTARY SANSKRIT.—Continuation of 3. *II*; (3).

Prerequisite: Comparative Philology 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Comparative Philology	4	3	—	10	—	10	—	10	—	205 L. H.	Bloomfield

C. SCANDINAVIAN

UNDERGRADUATE COURSES NOT OPEN TO FRESHMEN

[1a-1b. ELEMENTARY NORWEGIAN.—*I, II*; (3). Not given, 1914-15.]

[2. ELEMENTARY SWEDISH.—*I*; (2). Not given, 1914-15.]

3. ADVANCED NORWEGIAN.—Ibsen; Björnson. Critical Study. *II*; (2).

Prerequisite: Scandinavian 1a-1b, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	3	2	—							205 L. H.	Flom
								(Arrange)			

4a-4b. ADVANCED SWEDISH.—*I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	4a	2	—							209 L. H.	Flom
								(Arrange)			

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	4b	2	—					(Arrange)		209 L. H.	Flom

[5. HENRIK IBSEN.—II; (2). Not given, 1914-15.]

6. IBSEN'S SOCIAL DRAMAS.—Lectures; interpretation of four of the social dramas; Ibsen's technique. Archer's translation is used. II; (2).

Prerequisite: Junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	6	2	—		9		9	—	—	205 L. H.	Flom

12. NORSE MYTHOLOGY.—Primitive religion; the religious belief of the Norseman in pre-Christian times; interpretation of the principal myths; theogony, cosmogony, and the myth of the end of the world. I; (2).

Prerequisite: Junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	12	2	—	—	9	—	9	—	—	205 L. H.	Flom

14. HISTORY OF OLD NORSE LITERATURE.—II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	14	2	—					(Arrange)		205 L. H.	Flom

30. SCANDINAVIAN DRAMA.—I; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	30	1	—	—	—	10	—	—	—	209 L. H.	Flom

COURSES FOR GRADUATES

Preparation for graduate work in the Scandinavian languages or literature must include a reading knowledge of one of the Scandinavian languages and systematic work in the undergraduate courses in Scandinavian or their equivalent. Any graduate student in language may, however, be admitted to the purely philological courses.

101. OLD NORSE.—Introduction to the language as a member of the Germanic group. Reading of the *Volsungasaga* with selections from the King's Sagas. I, II; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	101	1 unit	—					(Arrange)		209 L. H.	Flom

[102. OLD DANISH.—*Twice a week*; I; (1 unit). Not given, 1914-15.]

110. ADVANCED OLD NORSE.—Mythical lays of the *Elder Edda*. *Twice a week*; I; (1 unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	110	1 unit	—					(Arrange)		209 L. H.	Flom

HISTORY

EVARTS BOUTELL GREENE, Ph.D., *Professor*
 CLARENCE WALWORTH ALVORD, Ph.D., *Professor*
 LAURENCE MARCELLUS LARSON, Ph.D., *Professor*
 ALBERT HOWE LYBYER, Ph.D., *Associate Professor*
 WILLIAM SPENCE ROBERTSON, Ph.D., *Assistant Professor*
 PAUL VAN BRUNT JONES, Ph.D., *Associate*
 THEODORE CALVIN PEASE, Ph.D., *Associate*
 ARTHUR CHARLES COLE, Ph.D., *Instructor*
 ELIZABETH PARNHAM BRUSH, A.M., *Assistant*
 JAY EARLL MILLER, A.M., LL.B., *Assistant*

Co-operating:

WILLIAM ABBOTT OLDFATHER, Ph.D., *Associate Professor, Greek*
 HOWARD VERNON CANTER, Ph.D., *Associate Professor, Latin*

Of the courses listed below, History 1 (Continental European history) and History 2 (English history), which are intended primarily for freshmen and sophomores and may not be taken for full credit by seniors, furnish the best general introduction to the advanced courses of the department. History 3 (American history) is especially appropriate for sophomores, and is the ordinary prerequisite for advanced courses in this subject. For those who expect to teach history or classics in secondary schools courses 5 and 6 (Ancient history) will be useful. It is not, however, necessary or desirable that the same student should take all of these introductory courses. The junior and senior years should be given to distinctly advanced courses, especially those listed in group B below. The introductory courses in economics and political science (Economics 1 and Political Science 1 and 3) are especially recommended to students in this department. The importance of thoro linguistic training is also emphasized, particularly in Latin, French, and German.

Honors

Candidates for honors, as distinguished from a major, in history must offer:

1. Not less than 24 hours in this subject, including History 1 and 3, at least 3 hours of English history, and at least 6 hours in Group B.
2. Two minor subjects aggregating at least 24 hours, approved by the department, including in each case some advanced work. The minors must be selected from the following list: economics; political science; law; philosophy, including a course in logic and one in the history of philosophy (one course in education or psychology may be accepted as a part of the requirement in philosophy); English literature; the classics. Economics or political science must be offered as one of the minor subjects. The ability to read simple prose in one foreign language is ordinarily expected of candidates in history, and students who have pursued the study of Romance languages or Germanic languages so far as to include courses in the history of literature may count one of these subjects as a minor. The minor subjects above named will, for the present, be accepted as minors for students who are candidates for the ordinary degree of A.B.

COURSES FOR UNDERGRADUATES ONLY

1a-1b. CONTINENTAL EUROPEAN HISTORY.—Europe from the fourth century to the present time. (The work of neither semester may be taken separately without special permission.) I, II; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	1a	4	Lecture	—	10	—	10	—	—	100 Com.	Lybyer
			A	—	—	8	—	8	—	211 U. H.	Brush
			B	—	—	9	—	9	—	211 U. H.	Jones
			C	—	—	10	—	10	—	211 U. H.	Brush
(Junior-Sophomore Section)			D	—	—	10	—	10	—	311 L. H.	Lybyer
			E	—	—	11	—	11	—	211 U. H.	Jones
			F	—	—	1	—	1	—	211 U. H.	Miller
			G	—	—	2	—	2	—	211 U. H.	Jones
			H	—	9	—	9	—	—	211 U. H.	Brush

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	1b	4	—	Sections and schedule the same as for 1a (first semester).							

2a-2b. ENGLISH HISTORY.—First Semester; political history of England to 1602, with some attention to the larger social, economic, and religious movements. Second Semester; the modern history of England with emphasis on colonial and imperial development. *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	2a	3	Lecture	—	—	—	—	—	—	418 U. H.	Larson, Cole
			A	—	—	—	—	8	—	418 U. H.	Miller
			B	—	—	—	—	9	—	418 U. H.	Larson
			C	—	—	—	—	11	—	418 U. H.	Brush
			D	—	—	—	—	1	—	418 U. H.	Cole

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	2b	3	—	Sections and schedule the same as for 2a (first semester).							

3a-3b. HISTORY OF THE UNITED STATES.—First Semester; the Colonial Era; the Revolution; genesis of the Federal Constitution. Second Semester; the United States under the Constitution. (Either semester may be taken separately). *I, II; (3).*

Prerequisite: One year of college work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	3a	3	Lecture	8	—	—	—	8	—	100 Com.	Greene, Cole
			A	—	—	8	—	—	—	212 U. H.	Cole
			B	—	8	—	—	—	—	212 U. H.	Cole
			C	—	—	—	8	—	—	212 U. H.	Cole
(Honor Section)			D	—	—	8	—	—	—	305 L. H.	Greene

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	3b	3	Lecture	8	—	—	—	8	—	100 Com.	Robertson, Cole
			A	—	—	8	—	—	—	212 U. H.	Cole
			B	—	8	—	—	—	—	212 U. H.	Cole
			C	—	—	—	8	—	—	212 U. H.	Cole
(Honor Section)			D	—	—	8	—	—	—	305 L. H.	Robertson

5. HISTORY OF GREECE.—*I; (3).* (See Greek 20.)

Prerequisite: One college course in history or the classics. Not open to freshmen.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	5	3	—	3	—	3	—	3	—	120 L. H.	Oldfather

6. HISTORY OF ROME.—II; (3). (See Latin 19.)

Prerequisite: One college course in history or the classics. Not open to freshmen.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	6	3	—	3	—	3	—	3	—	120 L. H.	Canter

[17. THE HISTORY OF ILLINOIS.—The political, economic, and social development of a typical commonwealth in the Middle West, considered in its relation to the general course of American history. II; (2). Not given in 1914-15.

Prerequisite: History 3a-3b or junior standing in any college of the University.]

18. THE TEACHING OF HISTORY.—Preparation of students for the practical problems of historical teaching in secondary schools. I; (2).

Prerequisite: History 1a-1b, 3a-3b, or their equivalent; senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	18	2	—	—	3	—	3	—	—	311 L. H.	Cole

28a-28b. THESIS.—For candidates for honors and for other seniors who wish special training in investigation. I, II; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	28a	2	—							(Arrange)	Robertson and others

SECOND SEMESTER

History	28b	2	—	Schedule the same as for 28a (first semester).							
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COURSES FOR UNDERGRADUATES AND GRADUATES

(Open to seniors and to juniors of high standing. The ability to use French and German is desirable in the courses of this group.)

4a-4b. THE CONSTITUTIONAL HISTORY OF ENGLAND.—First Semester; institutional origins. Second Semester; modern constitutional practise. (Important for students who wish to specialize in history, political science, or law.) I, II; (3).

Prerequisite: One year of college history.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	4a	3	—	10	—	10	—	10	—	305 L. H.	Larson

SECOND SEMESTER

History	4b	3	—	Schedule the same as for 4a (first semester).							
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[7. THE REVOLUTIONARY AND NAPOLEONIC ERA.—I; (3). Not given in 1914-15.

Prerequisite: History 1a-1b.]

19. FRANCE IN THE FEUDAL AND LATER MIDDLE AGES WITH SPECIAL REFERENCE TO INSTITUTIONS.—A reading knowledge of French is required. This course may be combined with History 8 (English Civilization in the Middle Ages). *I*; (3).

Prerequisite: History 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	19	3	—	—	2	—	2	—	—	311 L. H.	Jones

20a-20b. EUROPE FROM THE PERIOD OF THE NAPOLEONIC EMPIRE TO THE PRESENT TIME.—Political movements and the development of civilization as the historical basis for an understanding of contemporary European life. First Semester; the nineteenth century to the formation of the German Empire in 1871. Second Semester; Europe since 1871. (Either semester may be taken separately.) *I, II*; (3).

Prerequisite: At least one year of college work in history or political science, and at least junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	20a	3	—	9	—	9	—	9	—	311 L. H.	Lybyer

SECOND SEMESTER

History	20b	3	—	Schedule the same as for 20a (first semester).							
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21. HISTORY OF THE UNITED STATES SINCE THE RECONSTRUCTION.—Historical introduction to contemporary American politics. *I*; (3).

Prerequisite: History 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	21	3	—	—	8	—	8	—	—	305 L. H.	Robertson

26. THE HISTORY OF THE LATIN-AMERICAN COLONIES.—The political, economic, social, and intellectual life of Spain during the period of discovery; the exploration, settlement, and civilization of Spanish America and the Philippines; the exploration and colonization of Brazil. *I*; (3).

Prerequisite: History 1a-1b or 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	26	3	—	2	—	2	—	2	—	305 L. H.	Robertson

27. THE HISTORY OF LATIN-AMERICA FROM THE WARS OF INDEPENDENCE TO THE PRESENT TIME.—The national history of the leading Latin-American states; political parties; existing governments; relations with Europe and the United States; the Old Regime in Texas, Mexico, and California. *II*; (3).

Prerequisite: History 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	27	3	—	2	—	2	—	2	—	305 L. H.	Robertson

29. THE FAR EAST.—The contact of Western Christendom with the Far East from the Portuguese establishments of the sixteenth century to the Chinese revolution of 1911, with special reference to China and Japan. *II*; (2).

Prerequisite: Senior standing including at least one year of college work in history, economics, or political science.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	29	2	—	—	8	—	8	—	—	305 L. H.	Greene

COURSES FOR GRADUATES

A student entering upon graduate work should have had at least the equivalent of the introductory courses in European and American history. All students of history should have a reading knowledge of German and French; for medieval history some knowledge of Latin is indispensable, and in certain fields of American history Spanish is needed.

Graduate courses in history at the University of Illinois are of three kinds: 1. Instruction in methodology, historiography, and bibliography. This work (in course 103a-103b) is required of all graduate students in history during their first year. 2. Seminar courses for the study of special fields with a view primarily to training in the methods of historical criticism and research. 3. Courses for information and guidance in general reading.

ILLINOIS SURVEY.—Students of history have an opportunity to pursue research in western history in connection with the Illinois Survey, an organization for the purpose of carrying on systematic studies in the history of Illinois.

The History Club, consisting of graduate students and instructors, devotes its programs to reviews of current progress in historical work and informal discussion of historical topics.

101. SEMINAR IN AMERICAN HISTORY.—Bibliography; practise in the solution of typical problems; reports on the progress of individual investigations by instructors and students. *Once a week; I, II.** Professor GREENE and others.

Students interested in the investigation of special topics, whether with a view to writing theses or otherwise, may register in this course and will be advised by members of the department as follows:

On American history before 1789 and problems of church and state.

Professor GREENE

On American history after 1789 and Latin-American history.

Assistant Professor ROBERTSON, Dr. COLE

On the history of the West.

Professor ALVORD

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	101	—	—	—	—	—	—	—	8,9	303 L. H.	Greene and others

102. STUDIES IN ENGLISH HISTORY.—*Twice a week; I, II.**

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	102	—	—							303 L. H.	Larson

(Arrange)

103. HISTORICAL BIBLIOGRAPHY AND CRITICISM.—Selected problems in various fields. Required of all candidates for an advanced degree in history who

*The unit values of graduate courses in history are fixed at the time of registration, after conference with the instructors in charge of the courses.

do not present evidence of similar training elsewhere. *Twice a week; I, II; (½ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	103	½ unit	—	—	11	—	11	—	—	303 L. H.	Lybyer and others

104. RESEARCH IN EUROPEAN HISTORY.—Competent students will be guided in the investigation of topics in medieval and modern history. *I, II.**

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	104	—	—					(Arrange)		303 L. H.	Lybyer, Jones

105. THE HISTORY OF WESTERN EXPANSION, 1763-1818.—Problems in the interpretation of Western history. Lectures and readings. *Once a week; I, II; (½ to 1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	105	½ to 1 unit	—					(Arrange)		303 L. H.	Alvord

111. SPANISH-AMERICAN RELATIONS.—The relations of the Latin-American states with Europe and the United States. Selected topics. *Once a week; I, II.**

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	111	—	—					(Arrange)		303 L. H.	Robertson

112. STUDIES IN AMERICAN RELIGIOUS HISTORY.—Questions of Church and State. *Once or twice a week at the option of the instructor. I, II.**

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	112	—	—					(Arrange)		303 L. H.	Greene

HORTICULTURE

JOSEPH CULLEN BLAIR, M.S., *Professor, Pomology*
 JOHN WILLIAM LLOYD, M.S., *Professor, Olericulture*
 CHARLES SPENCER CRANDALL, M.S., *Professor, Pomology*
 CHARLES MULFORD ROBINSON, A.M., *Professor, Civic Design*
 HERMAN BERNARD DORNER, M.S., *Assistant Professor, Floriculture*
 BETHEL STEWART PICKETT, M.S., *Assistant Professor, Pomology*
 WILHELM MILLER, Ph.D., *Assistant Professor, Landscape Horticulture*
 RALPH RODNEY ROOT, M.L.A., *Assistant Professor, Landscape Gardening*
 ERNEST WINFIELD BAILEY, M.S., *Associate, Pomology*
 OSCAR S. WATKINS, B.S., *Associate, Horticultural Chemistry*
 CHARLES ELMER DURST, M.S., *Associate, Olericulture*
 SIMEON JAMES BOLE, A.M., *Associate, Pomology*
 JOHN JOSEPH GARDNER, M.S., *Associate, Pomology*
 LAWRENCE EARL FOGLESONG, B.S., *Instructor, Landscape Horticulture*

*The unit values of graduate courses in history are fixed at the time of registration, after conference with the instructor in charge of the courses.

FRANK A. CUSHING SMITH, B.S., *Instructor, Landscape Design*
 CHARLES BOVETT SAYRE, B.S., *Instructor, Olericulture*
 ROBERT WILLIAM HOFFMAN, B.S., *Instructor, Landscape Gardening*
 FREDERICK NOBLE EVANS, B.S., *Instructor, Landscape Design*
 ARTHUR SAMUEL COLBY, B.S., *Assistant, Pomology*
 FRANZ AUGUST AUST, M.S., *Assistant, Landscape Design*
 CHARLES CHRISTIAN REES, *Assistant, Pathology*
 HOWARD DEXTER BROWN, B.S., *Assistant, Olericulture*
 AUGUST GEORGE HECHT, B.S., *Assistant, Floriculture*

1a. ELEMENTS OF HORTICULTURE.—Fruit growing, vegetable gardening, and ornamental planting, with special reference to the farm home. Required of all freshmen in the general course in Agriculture. Recitations; practical exercises. I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
*Horticulture	1a	2	A, Quiz	—	3	—	3	—	—	701 Ag.	Lloyd
			B, Quiz	—	3	—	3	—	—	302 Ag.	Pickett
			C, Quiz	—	3	—	3	—	—	702 Ag.	Gardner
			D, Quiz	—	3	—	3	—	—	703 Ag.	Colby
			E, Quiz	—	10	—	10	—	—	701 Ag.	Lloyd
			F, Quiz	—	11	—	11	—	—	302 Ag.	Pickett
			G, Quiz	—	10	—	10	—	—	302 Ag.	Gardner
			H, Quiz	10	—	10	—	—	—	302 Ag.	Colby
			A, Lab.	8,9	—	—	—	—	—	309 Ag.	Lloyd
			B, Lab.	—	—	8,9	—	—	—	309 Ag.	Pickett
			C, Lab.	1,2	—	—	—	—	—	309 Ag.	Gardner
			D, Lab.	—	1,2	—	—	—	—	302 Ag.	Colby
			E, Lab.	—	—	1,2	—	—	—	309 Ag.	Lloyd
			F, Lab.	—	—	—	1,2	—	—	302 Ag.	Pickett
			G, Lab.	—	—	—	—	1,2	—	309 Ag.	Gardner
			H, Lab.	—	—	—	—	—	10,11	309 Ag.	Lloyd

1b. ELEMENTS OF HORTICULTURE.—A continuation of 1a. Required of all freshmen in the general course in Agriculture. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
*Horticulture	1b	2	A, Quiz	—	3	—	3	—	—	309 Ag.	Colby
			B, Quiz	—	3	—	3	—	—	702 Ag.	Lloyd
			C, Quiz	—	3	—	3	—	—	302 Ag.	Pickett
			D, Quiz	—	3	—	3	—	—	701 Ag.	Gardner
			E, Quiz	—	10	—	10	—	—	302 Ag.	Colby
			F, Quiz	—	11	—	11	—	—	702 Ag.	Lloyd
			G, Quiz	—	11	—	11	—	—	302 Ag.	Pickett
			H, Quiz	10	—	10	—	—	—	309 Ag.	Gardner
			A, Lab.	—	8,9	—	—	—	—	302 Ag.	Colby
			B, Lab.	—	—	8,9	—	—	—	309 Ag.	Lloyd
			C, Lab.	—	—	—	8,9	—	—	309 Ag.	Pickett
			D, Lab.	—	—	—	—	—	8,9	309 Ag.	Gardner
			E, Lab.	1,2	—	—	—	—	—	309 Ag.	Colby
			F, Lab.	—	1,2	—	—	—	—	309 Ag.	Lloyd
			G, Lab.	—	—	1,2	—	—	—	302 Ag.	Pickett
			H, Lab.	—	—	—	1,2	—	—	309 Ag.	Gardner

2. SMALL FRUITS AND GRAPES.—The strawberry, raspberry, blackberry, dew-berry, currant, gooseberry, grape. History; extent of cultivation; soil; location;

*A student is expected to register in the same section for both laboratory and quiz.

fertilizers; propagation; planting; tillage; pruning; insect enemies; diseases; varieties; harvesting; marketing. Lectures; reference readings. *II*; (2).

Prerequisite: Horticulture 1a and 1b or their equivalents, 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	2	2	—	11	—	11	—	11	—	309 Ag.	Bole

3. VEGETABLE GARDENING.—The production and marketing of vegetables. Lectures; reference readings; practical exercises. *II*; (5).

Prerequisite: Horticulture 1a and 1b or their equivalents.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	3	5	Lecture	3	—	3	—	3	—	309 Ag.	Lloyd
			Laboratory	—	3,4	—	3,4	—	8,9	V. G.	Durst, Brown

4. PLANT HOUSES.—Construction, cost, and maintenance; heating; ventilating. *I*; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	4	4	—	3	3	3	3	—	—	F. G.	Dorner

5. PLANT PROPAGATION.—Grafts; buds; layers; cuttings; seeds. Lectures; laboratory; quizzes. *II*; (5).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	5	5	Lecture	1	1	—	1	—	—	F. G.	Dorner
			A, Laboratory	—	—	1,2	—	1,2	—	F. G.	Dorner Hecht
			B, Laboratory	—	2,3	—	2,3	—	—	F. G.	

6. NURSERY METHODS.—Some details of nursery management and their relation to horticulture in general. Lectures; reference readings. *II*; (2).

Prerequisite: Horticulture 5; Entomology 4a-4b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	6	2	—	—	1,2	—	1,2	—	—	302 Ag.	Pickett, Bailey

7. SPRAYING.—Materials, appliances, and methods employed in combating insects and fungous diseases. Lectures; reference readings; laboratory; field work. *II*; (3).

Prerequisite: Horticulture 1a and 1b or their equivalents; Chemistry 1; Entomology 4a-4b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	7	3	—	1,2	—	1,2	—	1,2	—	H. B.	Lloyd, Watkins

8. ORCHARDING.—Pomaceous, drupaceous, and nut fruits; management of large commercial orchards; harvesting; grading; packing; storing; marketing. *I*; (5).

Prerequisite: Horticulture 1a and 1b or their equivalents, 5; Botany 1; Entomology 4a-4b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	8	5	—	10	10,11	10	10,11	10	—	309, 303 Ag.	Crandall, Bailey, Bole

[9. FORESTRY.—Forest trees; uses; distribution; artificial production; relations of forest and climate; forestry legislation and economy. *II*; (2). Not given, 1914-15.

Prerequisite: Botany 1, or an equivalent.]

10a. LANDSCAPE GARDENING.—Lectures; reference reading; drafting; plant studies; field trips. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	10a	3	Lecture	—	11	—	11	—	—	309 Ag.	Smith
			A, Laboratory	—	1,2,3	—	—	—	—	309 Ag.	Smith
			B, Laboratory	—	—	—	—	—	8,9,10	309 Ag.	Smith

10b. LANDSCAPE DESIGN (ELEMENTARY COURSE).—Drafting; field trips; assigned readings; reports; occasional lectures. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	10b	3	Lecture	—	—	—	1	—	—	309 Ag.	Root
			Laboratory				(Arrange)			208 Ag.	Smith

11. STUDY OF CULTIVATED PLANTS.—The relationship and classification of certain economic and ornamental plants of the temperate zone; identification of species; examination of living plants and herbarium specimens. Lectures; assigned readings. *I*; (2).

Prerequisite: Botany 4a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	11	2	—	—	2	—	2	—	—	703 Ag.	Blair, Crandall

12. EVOLUTION OF HORTICULTURAL PLANTS.—History, botanical classification, and geographical distribution of cultivated plants; modification under culture; theoretical causes and observed factors that influence variation, particularly food supply, climate, and cross-fertilization. *I*; (3).

Prerequisite: Two years of University work, including Horticulture 8 and Botany 4a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	12	3	—	11	—	11	—	11	—	309 Ag.	Crandall

15a. PRINCIPLES OF PLANT GROWING.—Preparation of soils for greenhouse crops; fertilizers; potting and shifting plants; watering. Lectures; practical greenhouse work. *II*; (5).

Prerequisite: Horticulture 5; Botany 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	15a	5	Lecture	—	10	—	10	—	—	F. G.	Dorner
			Laboratory	10,11	—	10,11	—	10,11	—	F. G.	Dorner, Hecht

15b. COMMERCIAL CROPS.—Greenhouse plants and cut flowers for wholesale and retail markets; the care and marketing of the crops. Lectures; greenhouse work. *I*; (5).

Prerequisite: Horticulture 15a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	15b	5	Lecture	—	1	—	1	—	—	F. G.	Dorner
			Laboratory	1,2	—	1,2	—	1,2	—	F. G.	Dorner, Hecht

17. COMMERCIAL FRUIT CULTURE.—Practical work in houses and fruit plantations; reference readings; seminar. (For students specializing in horticulture). *I*; (5).

Prerequisite: Horticulture 2, 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	17	5	—	1,2	—	1,2	1,2	1,2	8-10	V. G.	Crandall, Bailey

18. EXPERIMENTAL HORTICULTURE.—Methods and difficulties in horticultural investigations; the planning of experiments; recording and interpretation of results. (For advanced students preparing for experiment station work.) *II*; (5).

Prerequisite: Twenty hours' work in Horticulture.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	18	5	—	9	9	9	9	9	—	302 Ag.	Blair, Pickett, Watkins

19. AMATEUR FLORICULTURE.—Window gardening; growing of flowers upon the home grounds; containers; potting soils; fertilizers; preparation and planting of flower beds; propagation and culture of plants suitable for window and garden. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	19	3	—	9	—	9	—	9	—	F. G.	Dorner

21a. LANDSCAPE DESIGN (ELEMENTARY COURSE).—Simple composition as applied to landscape design. *I*; (4).

Prerequisite: Architecture 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	21a	4	Lecture	9	—	—	—	—	—	303 Ag.	Evans
			Laboratory				(Arrange)			307 Ag.	Evans

21b. LANDSCAPE DESIGN (ELEMENTARY COURSE).—Types of drafting and presentation used in office practise. *II*; (4).

Prerequisite: Horticulture 21a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	21b	4	Lecture	9	—	—	—	—	—	303 Ag.	Evans
			Laboratory			(Arrange)				307 Ag.	Evans

22. SPECIAL INVESTIGATION AND THESIS.—*I or II*; *(5-10).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	22	*5 to 10	—					(Arrange)			—

23a-23b. LANDSCAPE DESIGN (SECOND COURSE).—Drafting; field trips; assigned readings; reports; occasional lectures. *I, II*; (4).

Prerequisite: Horticulture 21b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	23a	4	Lecture	—	—	—	—	10	—	303 Ag.	Root
			Laboratory			(Arrange)				307 Ag.	Root

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	23b	4	Lecture	—	—	—	—	10	—	303 Ag.	Root
			Laboratory			(Arrange)				307 Ag.	Root

24a. TREES AND SHRUBS.—Lectures; reference readings; field trips. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	24a	3	Lecture	3	—	3	—	—	—	303 Ag.	Root
			Laboratory			(Arrange)				—	Root

24b. TREES AND SHRUBS.—(Continuation of 24a). Lectures; reference readings; field trips. *I*; (3).

Prerequisite: Horticulture 24a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	24b	3	Lecture	3	—	3	—	—	—	303 Ag.	Root
			Laboratory			(Arrange)				—	Root

25a-25b. ADVANCED LANDSCAPE DESIGN.—Drafting; field trips; assigned readings; reports; occasional lectures; 15 hours' drafting per week. *I, II*; (5).

Prerequisite: Horticulture 23b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	25a	5	Lecture	—	1	—	—	—	—	306 Ag.	Evans
			Laboratory			(Arrange)				307 Ag.	Evans

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	25b	5	Lecture	—	1	—	—	—	—	306 Ag.	Evans
			Laboratory			(Arrange)				307 Ag.	Evans

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

26a-26b. PLANTING DESIGN.—Plant plans; conferences; library research; drafting. One conference and 8 hours drawing per week. *I, II; (3).*

Prerequisite: Horticulture 23a, 24b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	26a	3	Lecture	—	—	—	—	1	—	306 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	26b	3	Lecture	—	—	—	—	1	—	306 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

27a-27b. LANDSCAPE PRACTISE.—Principles of construction. The preparation of construction drawings such as grading plans, working drawings, specifications, and reports. *I, II; (3).*

Prerequisite: C. E. 28.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	27a	3	Lecture	—	—	—	—	9	—	302 Ag.	Smith
			Laboratory				(Arrange)			307 Ag.	Smith

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	27b	3	Lecture	—	8	—	8	—	—	302 Ag.	Smith
			Laboratory				(Arrange)			307 Ag.	Smith

28. EXOTICS.—Temporary decorative plants used in landscape gardening. Lectures; planting plans; field trips. *II; (1).*

Prerequisite: Horticulture 23b, 24b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	28	1	Lecture	—	—	—	—	—	9	306 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

29a. GARDEN DESIGN.—The garden in its relation to the house; architectural harmony, utilization, topographic conditions, and planting for architectural or horticultural emphasis. 8 hours drafting; 1 lecture. *I; (3).*

Prerequisite: Architecture 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	29a	3	Lecture	—	—	10	—	—	—	306 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

29b. GARDEN DESIGN.—The designing of public gardens and open spaces and their relation to garden design. 8 hours drafting; 1 lecture. *II; (3).*

Prerequisite: Horticulture 23a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	29b	3	Lecture	—	—	10	—	—	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

30. DECORATIVE AND BEDDING PLANTS.—Tropical and sub-tropical plants used in decorative work in the conservatory; tender plants used in out-door bedding. Lectures; practical greenhouse work. *II*; (5).

Prerequisite: Horticulture 15a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	30	5	Lecture	—	8	—	8	—	—	F. G.	Dorner
			Laboratory	8,9	—	8,9	—	8,9	—	F. G.	Dorner, Hecht

31. GARDEN FLOWERS.—The propagation and growing of annuals, herbaceous perennials, bulbs, and shrubs for cut flowers and ornamental plantings. *I*; (3).

Prerequisite: Horticulture 5; Botany 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	31	3	Lecture	10	—	10	—	10	—	F. G.	Dorner
			Laboratory				(Arrange)			F. G.	Dorner

32. FLORAL DECORATION.—Cut flowers and plants in decorative work; arrangement of flowers in baskets, designs, and bouquets; table decoration; house decoration. (For floricultural students.) *II*; (4).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	32	4	Lecture	3	—	3	—	3	—	F. G.	Dorner
			Laboratory	—	—	—	—	—	8-12	F. G.	Dorner

[33. SYSTEMATIC POMOLOGY.—Description, nomenclature, and classification of native and sub-tropical fruits; critical descriptions and identification with special reference to relationships and classifications of varieties. In addition, training is given in judging and displaying fruits. *I*; (2). Not given, 1914-15.

Prerequisite: Horticulture 8.]

34. VEGETABLES UNDER GLASS.—Practical training in the forcing of vegetables. Lectures; reference readings; laboratory. *I*; (3).

Prerequisite: Horticulture 3, 15a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	34	3	—	1,2	—	1,2	—	1,2	—	V. G.	Durst, Brown

35. PRIVATE CONSERVATORY WORK.—Types of plants for large conservatories; arrangement; care. *II*; (3).

Prerequisite: Horticulture 15a, 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	35	3	—				(Arrange)			F. G.	Dorner

36. LANDSCAPE GARDENING LITERATURE.—Lectures; reference readings; library sketches; reports. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	36	2	—	—	11	—	11	—	—	303 Ag.	Root

37a-37b. CIVIC DESIGN.—Lectures; field trips; reports. *I, II; (3).*

Prerequisite: Horticulture 23b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	37a	2	—					(Arrange)		306-B. Ag.	Robinson

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	37b	3	—					(Arrange)		306-B. Ag.	Robinson

38. FIELD PRACTISE IN LANDSCAPE GARDENING.—Lectures; field work; reports. Actual practise in carrying out landscape plans in the field. *I or II; (2).*

Prerequisite: Horticulture 27a, 26b.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	38	2	Lecture	—	2	—	2	—	—	303 Ag.	Smith
			Laboratory					(Arrange)			Smith

39. SPECIAL LECTURES.—Lectures by members of the faculty and invited lecturers, dealing with the working out of various problems in landscape gardening. Required of students taking the professional course in landscape gardening. One lecture per week with written reports. *I or II; (1).*

Prerequisite: Permission of the instructor in charge.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	39	1	—	—	—	—	—	3	—	303 Ag.	Root

40a. TREES AND SHRUBS (ADVANCED COURSE).—Laboratory; field and herbarium work; assigned readings; seminar conferences. *I; (3).*

Prerequisite: Horticulture 24b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	40a	3	Lecture	—	3	—	3	—	—	306 Ag.	Root
			Laboratory					(Arrange)		306 Ag.	Hoffman

40b. TREES AND SHRUBS. (ADVANCED COURSE).—Special problems in the classification and arrangement of plants as to their leaf color. *II; (3).*

Prerequisite: Horticulture 24b, 26b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	40b	3	Lecture	—	3	—	3	—	—	306 Ag.	Root
			Laboratory					(Arrange)		306 Ag.	Hoffman

HOUSEHOLD SCIENCE

ISABEL BEVIER, Ph.M., *Professor and Director*

NELLIE ESTHER GOLDTHWAITE, Ph.D., *Assistant Professor*

CORA EMELINE GRAY, M.S., *Associate*

RUTH WHEELER, Ph.D., *Associate*

LURENE SEYMOUR, Ph.B., B.S., *Associate*

MAUD EDNA PARSONS, A.B., *Instructor and Director of Lunch Room*

GEORGIA ELIZABETH FLEMING, B.S., *Instructor*

GRACE ESTHER STEVENS, A.B., *Instructor*

FLORENCE HARRISON, B.S., *Instructor*

ANNA WALLER WILLIAMS, A.M., *Instructor*

GRETA GRAY, B.S., A.M., *Instructor*

I. SELECTION AND PREPARATION OF FOOD.—The nature and use of foods, their chemical composition, and the changes effected by heat, cold, or fermentation; the principles of selection, illustrated by marketing expeditions; processes of the manufacture of foods; combinations of different kinds. *II*; (3).

Prerequisite: Entrance credit in Physics; Chemistry I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	1	3	A, Laboratory	8,9	—	8,9	—	—	—	W. H.	Stevens, Gray, G.
			B ₁ , Laboratory	10,11	—	10,11	—	—	—		
			B ₂ , Laboratory	10,11	—	10,11	—	—	—		
			C, Laboratory	2,3	—	2,3	—	—	—		
			D ₁ , Laboratory	—	8,9	—	8,9	—	—		
			D ₂ , Laboratory	—	8,9	—	8,9	—	—		
			E ₁ , Laboratory	—	2,3	—	2,3	—	—		
			E ₂ , Laboratory	—	2,3	—	2,3	—	—		
			Lecture	—	—	—	11	—	—		
			Quiz	—	—	—	—	8,10,2	—		

3. ELEMENTARY HOME DECORATION.—(Continuation of course 2). Evolution of the house; homes of primitive peoples; theory of color and its application in home decoration; evolution of the home; furnishings from a sanitary and artistic standpoint. *II*; (2).

Prerequisite: Art and Design 12; Household Science 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	3	2	—	—	9	—	9	—	—	W. H.	Bevier, Fleming

5a-5b. DIETETICS.—The principles of diet; the relation of food to health; influence of age, sex, and occupation on diet; the construction of dietaries; dietetic treatment of certain diseases. Laboratory. *I, II*; (3).

Prerequisite: Household Science 1, 6; Physiology 4a-4b; Chemistry 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	5a	3	—	11	—	11	—	11	—	W. H.	Goldthwaite

SECOND SEMESTER

Household Science	5b	3	—	Schedule the same as for 5a (first semester).							
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14a-14b. PROBLEMS IN THE PREPARATION AND SERVICE OF FOOD.—(Continuation of courses 1 and 6). Preparation and service of meals for a family; cost and dietetic values; the preparation of food in quantities; individual problems in the manipulation of food materials. *I, II*; (3).

Open to: a. Those who are preparing for lunch-room management. b. Those who are preparing for extension work. c. In special cases, to those who have completed the major in Household Science.

Prerequisite: Household Science I, 6; Chemistry I, 2, 3; junior standing and the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	14a	3	A, Laboratory	5:30	—	5:30	—	—	—	W. H.	Gray, C. Williams
			B, Extension	10,11	—	10,11	—	10,11	—		

SECOND SEMESTER

Household Science	14b	3	—	Sections and schedule the same as 14a (first semester).							
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17. PROBLEMS IN THE STUDY OF TEXTILES.—The quality of material; microscopic and chemical analysis of fabrics; movements related to the textile industry. Lectures; laboratory. *II*; (3).

Prerequisite: Household Science 7a-7b, 12; Chemistry I, 2, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	17	3	Lecture	—	—	—	—	2	—	W. H.	Seymour
			Laboratory	2,3	—	2,3	—	—	—	W. H.	Seymour

18a-18b. LUNCH ROOM MANAGEMENT.—History of the movement to feed school children; practise in lunch room management. Open to seniors. *I, II*; (3).

Prerequisite: Household Science I, 5a-5b, 6 and 14a-14b; Economics I or 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	18a	3	Lecture and Quiz	—	9	—	9	—	—	W. H.	Parsons
			Laboratory	Two 3-hr. periods.						(Arrange)	

SECOND SEMESTER

Household Science	18b	3	—	Schedule the same as for 18a (first semester).							
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2. HOME ARCHITECTURE AND SANITATION.—Situation, surroundings, and construction of the house; hygiene of the home; heating, lighting, ventilating, water supply, and drainage. Lectures on house planning and sanitary plumbing, fixtures and internal drainage; exercise in making skeleton plans. *I*; (2).

NOTE.—Only one credit for seniors.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	2	2	—	—	9	—	9	—	9	W. H.	Bevier Fleming Gray, G. Clark Ash
			—	—	9	—	9	—	9	W. H.	
			—	—	9	—	9	—	9	W. H.	
			—	—	9	—	9	—	9	W. H.	

4. FOOD AND NUTRITION.—Application of the principles of pure science to the physiological, chemical, or bacteriological problems of food and nutrition. Individual investigation. *I*; (5).

Prerequisite: Bacteriology 5; Chemistry I, 2, 3, 13a, 9, 9c, five hours in botany or zoology; Household Science I, 5a-5b, 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	4	5	—	8,9	8,9	8,9	8,9	8,9	—	W. H.	Goldthwaite

7a-7b. TEXTILES.—Development of primitive industries; production of fibers used in textile manufacture; practise in judging cloth and in weaving. *I, II; (2).*

NOTE.—Only 1 credit for seniors.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	7a	2	Lecture	—	10	—	—	—	—	W. II.	Seymour
			A, Quiz	3	—	—	—	—	—		
			B, Quiz	—	—	3	—	—	—		
			C, Quiz	—	—	—	8	—	—		
			D, Quiz	—	—	—	10	—	—		
			E, Quiz	—	—	—	3	—	—		
SECOND SEMESTER											
Household Science	7b	2	Lecture	—	1	—	—	—	—	W. II.	Seymour
			A, Quiz	—	—	—	8	—	—		
			B, Quiz	—	—	—	11	—	—		

9. SEMINAR.—Different phases of home economics; individual problems. *II; (3).*

Prerequisite: Senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	9	3	—	2	—	2	—	2	—	W. H.	Bevier, Wheeler

10. HOUSEHOLD MANAGEMENT.—Expenditure of the income; organization of the household; care of the house and family; home nursing; domestic service problem. Laboratory work in practise apartment. *II; (2).*

Prerequisite: Household Science I, 2, 6; Economics I or 2; junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	10	2	—	—	2	—	2	—	—	W. H.	Gray, Williams

11. *TEACHERS' COURSE.—The best methods of presenting the work, and its correlation with other subjects. Practise in planning such courses, and some opportunity for presenting them. (For the prospective supervisor of the subject, or for the teacher in the graded schools). *II; (3).*

Prerequisite: Household Science I, 2, 3, 5a-5b, 6, 7a-7b, 12, and 13; laboratory work in sewing, Saturday morning, first semester; senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	11	3	—	—	10	—	10	—	—	W. H.	Bevier, Harrison

12. HOUSEHOLD ART AND CLOTHING.—(Continuation of course 7a-7b). Materials suitable for various uses in home and in clothing; texture, quality, design in relation to form; color in relation to environment and personality; hygienic properties and cost. *II; (3).*

Prerequisite: Household Science 7a-7b; Art and Design 1, 12; 30 hours of university work; proof, by examination or otherwise, of the ability to sew.

*Millinery for those taking Household Science 11 is given from 10 to 12 o'clock on Saturday the second semester, and sewing from 10 to 12 o'clock the first semester.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	12	3	Lecture	—	8	—	—	—	—		
			A, Laboratory	1,2	—	1,2	—	—	—	W. H.	Seymour, Fleming
			B, Laboratory	—	10,11	—	10,11	—	—		
			C, Laboratory	—	1,2	—	1,2	—	—		

6. ECONOMIC USES OF FOOD.—(Continuation of 1.) The economics of the food question; uses and applications of preservatives. *I*; (3).

Prerequisite: Household Science 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	6	3	A, Laboratory	8,9	—	8,9	—	—	—		Crigler, Stevens, Gray, G.
			B ₁ , Laboratory	10,11	—	10,11	—	—	—		
			B ₂ , Laboratory	10,11	—	10,11	—	—	—		
			C, Laboratory	2,3	—	2,3	—	—	—		
			D ₁ , Laboratory	—	8,9	—	8,9	—	—	W. H.	
			D ₂ , Laboratory	—	8,9	—	8,9	—	—		
			E, Laboratory	—	2,3	—	2,3	—	—		
			Lecture	—	—	—	11	—	—		
			Quiz	—	—	—	—	8,10,2	—		

13. HISTORY OF HOME ECONOMICS.—Origin and development of home economics; the work in different types of institutions; the planning of courses for these types. *I*; (2).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	13	2	—	—	—	3	—	3	—	W. H.	Bevier, Harrison

15. ECONOMICS OF THE FAMILY GROUP.—The economic relations of the family as a whole and as individuals. Retail market; sources of income, social and industrial conditions affecting it; child labor; economic position of women. *I*; (3).

Prerequisite: Household Science 3, 6, 10, 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	15	3	—	2	—	2	—	2	—	W. H.	Gray

16a-16b. PROBLEMS IN THE ECONOMICS OF THE FAMILY GROUP.—Individual work in the senior seminar in economics. *I, II*; *(2-4). (Arrange.)

Professor KINLEY

Prerequisite: Household Science 15.

COURSES FOR GRADUATES

Students who wish to do graduate work in household science will find it to their advantage to specialize in either the scientific or the economic phases

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Law	3	3	—		(To be announced)					—	Carpenter

4. COMMON LAW PLEADING.—Andrew's *Stephen on Pleading*: Selected Illinois Cases. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	4	3	—							—	Harker

(To be announced).

5. CRIMINAL LAW.—Beale's *Cases on Criminal Law*, (2nd edition). I; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	5	4	—							—	Vernier

(To be announced)

6. PERSONAL PROPERTY.—Gray's *Cases on Property*, Vol. I, (2nd edition). I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	6	2	—							—	Green

(To be announced)

7. DOMESTIC RELATIONS.—Woodruff's *Cases on Domestic Relation*, (2nd edition). II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	7	2	—							—	Vernier

(To be announced)

SECOND YEAR COURSES

Required Courses

8. EVIDENCE.—Thayer's *Cases on Evidence*, (2nd edition). I; (5).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	8	5	—							—	Hale

(To be announced)

10a-10b. REAL PROPERTY.—Gray's *Cases on Property*, Vols. II and III, (2nd edition). I, II; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	10a	2	—							—	Carpenter

(To be announced)

SECOND SEMESTER

Law	10b	2	—								
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(To be announced)

II. AGENCY.—Wambaugh's *Cases on Agency*. I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	11	3	—								Carpenter

(To be announced)

12a-12b. EQUITY.—Ames' *Cases on Equity*. I; (3); II; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	12a	3	—							—	Pomeroy

(To be announced)

SECOND SEMESTER

Law	12b	2	—							—	Pomeroy
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(To be announced)

18. WILLS.—Gray's *Cases on Property*, Vol. IV, (2nd edition). II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	18	2	—							—	Pomeroy

(To be announced)

20. EQUITY PLEADING.—Thompson's *Cases on Equity Pleading*: Selected Illinois Cases. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	20	2	—							—	Harker

(To be announced)

- 35a-35b. MOOT COURT.—I, II; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	35a	1	—							—	Harker

(To be announced)

SECOND SEMESTER

Law	35b	1	—	Schedule the same as for 35a (first semester).							
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Elective Courses

(Open to Second and Third Year Students.)

9. SALES.—Williston's *Cases on Sales*, (2nd edition). II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	9	3	—							—	Hale

(To be announced)

13. DAMAGES.—(Case book to be announced later). I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	13	2	—							—	Decker

(To be announced)

14. CARRIERS.—Green's *Cases on Carriers*. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	14	3	—							—	Green

(To be announced)

- [27. FUTURE INTERESTS IN PROPERTY.—Gray's *Cases on Property*, Vol. V and part of Vol. VI, (2nd edition). II; (3). Given in alternate years; not given in 1914-15.]

28. INSURANCE.—Wambaugh's *Cases on Insurance*. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	28	2	—							—	Green

(To be announced)

29. CONVEYANCING.—Gray's *Cases on Property*, Vol. III and part of Vol. VI, (2nd edition). II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	29	2	—							—	Carpenter

(To be announced)

30. PUBLIC INTERNATIONAL LAW.—Lawrence's *Principles of International Law* and Scott's *Cases on International Law*. I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	30	3	—							—	Garner

(To be announced)

32. QUASI-CONTRACTS.—Woodruff's *Cases on Quasi-Contracts*. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	32	2	—							—	Vernier

(To be announced)

34. PUBLIC UTILITIES.—Wyman's *Cases on Public Service Companies*, (2nd edition). II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	34	2	—							—	Green

(To be announced)

THIRD YEAR COURSES

Required Courses

15. BILLS AND NOTES.—Huffcut's *Cases on Bills and Notes* (Colson's edition). I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	15	3	—							—	Vernier

(To be announced)

17a-17b. PRIVATE CORPORATIONS.—Canfield and Wormser's *Cases on Private Corporations*. I, II; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	17a	2	—							—	Green

(To be announced)

SECOND SEMESTER

Law 17b 2 — Schedule the same as for 17a (first semester).

19. PARTNERSHIP.—Mechem's *Cases on Partnership*, (2nd edition). II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	19	2	—							—	Hale

(To be announced)

21. SURETYSHIP.—Ames' *Cases on Suretyship*. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	21	3	—							—	Decker

(To be announced)

22. CONSTITUTIONAL LAW.—Hall's *Cases on Constitutional Law*. I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	22	3	—							—	Green

(To be announced)

36a-36b. MOOT COURT.—I, II; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	36a	2	—							—	Harker

(To be announced)

SECOND SEMESTER

Law	36b	2	—	Schedule the same as for 36a (first semester).							
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31. CONFLICT OF LAWS.—Beale's *Shorter Selection of Cases on Conflict of Laws*. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	31	2	—							—	Vernier

(To be announced)

38. ILLINOIS PROCEDURE.—I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	38	3	—							—	Harker

(To be announced)

Elective Courses

(Third Year Students May Also Elect Any of the Second Year Elective Courses not Previously Taken.)

16. TRUSTS.—Ames' *Cases on Trusts*, (2nd edition). II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	16	3	—							—	Vernier

(To be announced)

23. MORTGAGES AND THE RECORDING ACTS.—Wyman's *Cases on Mortgages* and part of Vol. VI of Gray's *Cases on Property*, (2nd edition). I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	23	2	—							—	Pomeroy

(To be announced)

24. MUNICIPAL CORPORATIONS.—Macy's *Cases on Municipal Corporations*. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	24	2	—							—	Pomeroy

(To be announced)

25. BANKRUPTCY.—Williston's *Cases on Bankruptcy*. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	25	2	—							—	Decker

(To be announced)

33. CONSTITUTIONAL LAW.—Hall's *Cases on Constitutional Law*. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	33	2	—							—	Green

(To be announced)

LIBRARY SCIENCE

PHINEAS LAWRENCE WINDSOR, Ph.B., *Director*

FRANCES SIMPSON, M.L., B.L.S., *Assistant Director, Assistant Professor*

FLORENCE RISING CURTIS, A.B., B.L.S., *Associate*

ERNEST JAMES REECE, Ph.B., *Instructor*

ETHEL BOND, A.B., B.L.S., *Instructor*

EDNA LYMAN SCOTT, *Special Lecturer*

ALMA M. PENROSE, A.B., *Reviser*

FRANCIS KEESE WYNKOOP DRURY, A.M., B.L.S., *Lecturer, Order Work*

EMMA FELSENTHAL, Ph.B., B.L.S., *Lecturer, General Reference*

ALICE SARAH JOHNSON, A.B., B.L.S., *Lecturer, General Reference*

EMMA REED JUTON, B.L.S., *Lecturer, Loans*

ADAH PATTON, B.L.S., *Lecturer, Cataloging*

MARGARET HUTCHINS, A.B., B.L.S., *Lecturer, General Reference*

2a-2b. REFERENCE WORK.—Methods of bibliographical research; the use of reference books; practical work in the reference department of the University library. *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	2a	3	A	9	—	9	—	—	—	305 L.	Simpson
			B	—	9	—	9	—	—	305 L.	Simpson

SECOND SEMESTER

Library Science 2b 3 — Sections and schedule the same as for 2a (first semester).

3a-3b. SELECTION OF BOOKS.—Principles of selection for libraries of different types; standard lists, critical periodicals, and other aids; practise in writing book annotations. *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	3a	2	—	—	—	—	—	9	—	305 L.	Felsenthal

SECOND SEMESTER

Library Science 3b 2 — Schedule the same as for 3a (first semester).

4a-4b. PRACTISE WORK.—Work in the various departments of the University library. To be taken with Library 2, 16, 17, 18, 19, 20, and 21. *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	4a	2	—	—	11	11	11	11	—	—	Reece

SECOND SEMESTER

Library Science 4b 2 — Schedule the same as for 4a (first semester).

6a-6b. SUBJECT BIBLIOGRAPHY.—Selection of books in special subjects; the literature and bibliography of each. Lectures given by professors in the respective departments of the University. *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	6a	2	—	—	11	—	11	—	—	309 L.	Windsor and others

SECOND SEMESTER

Library Science 6b 2 — Schedule the same as for 6a (first semester).

7. HISTORY OF LIBRARIES.—The foundation, development, and resources of the leading libraries of Europe and the United States. Given in alternate years. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	7	2	—	—	8	—	8	—	—	305 L.	Simpson

8. ADVANCED REFERENCE.—Transactions of learned societies; special periodicals and government publications; indexes and other works of value to a large reference department. *I*; (2).

Prerequisite: Library 2a-2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	8	2	—	11	—	—	9	—	—	309 L.	Simpson

[9. HISTORY OF BOOKS AND PRINTING.—History of the early forms of books; the invention and spread of printing; book illustration; book-binding. Given in alternate years. *II*; (2). Not given in 1914-15.]

10a-10b. PRACTISE WORK.—A continuation of Library 4, supplemented by one month of work as a member of the staff of an assigned public library. *I, II*; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	10a	4	—							(Arrange)	Curtis

SECOND SEMESTER

Library Science	10b	4	—							(Arrange)	Curtis
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12. GENERAL REFERENCE.—Classification and arrangement of books in the University library; the card catalogs; the more generally used reference books. (Intended for freshmen and sophomores in the University, not for students in Library School.) Repeated each semester. *I or II*; (2).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	12	2	A	3	—	—	—	—	—	305 L.	Felsenthal
			B	—	10	—	—	—	—	305 L.	Hutchins
			C	—	3	—	—	—	—	305 L.	Johnson

13a-13b. PUBLIC DOCUMENTS.—13a. Production and distribution of United States documents; their treatment and use as reference books. 13b. American state and municipal documents; publications of foreign governments. *I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	13a	2	—	—	—	11	—	11	—	309 L.	Reece

SECOND SEMESTER

Library Science	13b	2	—	Schedule the same as for 13a (first semester).							
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15a-15b. SEMINAR IN LIBRARY ECONOMY.—Special problems; library economy publications. *I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 15a	2	—	—	8-10	—	—	—	—	—	309 L.	Simpson and others

SECOND SEMESTER

Library Science 15b 2 — Schedule the same as for 15a (first semester).

16. ORDER, ACCESSION, AND SHELF WORK.—Order department records and routine; book-buying; publishers and discounts; copyright; serials and continuations; gifts; exchanges; duplicates; the accession book and its substitutes; the shelf list and its uses; the care of pamphlets, clippings, and maps. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 16	2	—	—	—	10	—	10	—	—	305 L.	Curtis

17. CLASSIFICATION.—Principles of book classification; the Dewey Decimal Classification; the Cutter Expansion Classification; book numbers. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 17	3	—	—	10	—	10	—	10	—	305 L.	Bond

18. CATALOGING.—Dictionary cataloging; subject headings; classed cataloging. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 18	3	—	—	8	—	8	—	8	—	305 L.	Bond

19. TRADE BIBLIOGRAPHY.—Books and periodicals used as tools of the book trade of America, England, Germany, and France. *II*; (1).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 19	1	—	—	—	10	—	—	—	—	305 L.	Reece

20. LOAN DEPARTMENT.—Records connected with the loan of books; representative loan systems; rules, regulations, and practises. *II*; (1).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 20	1	—	—	—	—	—	10	—	—	305 L.	Jutton

21. PRINTING, BINDING, AND INDEXING.—*Printing*: Printing for libraries; preparing copy and reading proof. *Binding*: Materials and methods of book-binding for libraries; practise in preparing books for the bindery and in making necessary records. *Indexing*: Indexes; the form of citation; the choice and arrangements of headings; kind of type. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 21	2	—	—	—	—	11	—	11	—	305 L.	Windsor, Curtis

22. LIBRARY EXTENSION.—Methods; library associations; library schools; library commissions; township and county library systems; traveling libraries; home libraries; other agencies. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 22	3	—	—	10	—	10	—	10	—	305 L.	Curtis

23a-23b. LIBRARY ADMINISTRATION AND CURRENT LIBRARY LITERATURE.—Current library periodicals, bulletins, reports, catalogs, and reading lists; the organization, reorganization, and administration of small libraries; the planning and equipment of reading rooms and small library buildings; library accounts and business forms. *I, II; (1).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 23a	1	—	—	11	—	—	—	—	—	305 L.	Curtis

SECOND SEMESTER

Library Science 23b	1	—	—	Schedule the same as for 23a (first semester).							
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24a-24b. SELECTION OF BOOKS.—English translations of representative works of French, German, Spanish, Italian and Russian novelists of the 19th century; examination of about forty newly published books. *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 24a	2	—	—	—	10	—	—	—	—	309 L.	Drury

SECOND SEMESTER

Library Science 24b	2	—	—	Schedule the same as for 24a (first semester).							
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25. ADVANCED CLASSIFICATION AND CATALOGING.—The principal systems of book classification; rules for cataloging books. *II; (1).*

Prerequisite: Library 17, 18.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 25	1	—	—	—	—	—	10	—	—	309 L.	Bond

26a-26b. LIBRARY ADMINISTRATION.—Advanced order work; library organization; library architecture; legislative and municipal reference work; library work with children; special topics. *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 26a	3	—	—	10	—	10	—	10	—	—	Simpson, Drury, Scott, Reece, and others

SECOND SEMESTER

Library Science 26b	3	—	—	Schedule the same as for 26a (first semester).							
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27. BIBLIOGRAPHICAL INSTITUTIONS.—Organization and work of bibliographical societies and institutions of America and Europe; co-operative bibliographical undertakings; international bibliography. *I; (1).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 27	1	—	—	—	—	—	10	—	—	309 L.	Patton

28. PRACTISE WORK.—Advanced practise work in certain departments of the University library. *II; *(1 to 4).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 28	*1 to 4	—	—								
(Arrange)											

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

MATHEMATICS

EDGAR JEROME TOWNSEND, Ph.D., <i>Professor</i>
SAMUEL WALKER SHATTUCK, C.E., LL.D., <i>Professor, Emeritus</i>
GEORGE ABRAM MILLER, Ph.D., <i>Professor</i>
HENRY LEWIS RIETZ, Ph.D., <i>Professor</i>
CHARLES HIRSCHSEL SISAM, Ph.D., <i>Assistant Professor</i>
JAMES BYRNE SHAW, D.Sc., <i>Assistant Professor</i>
ARNOLD EMCH, Ph.D., <i>Assistant Professor</i>
ARTHUR ROBERT CRATHORNE, Ph.D., <i>Associate</i>
ROBERT LACY BORGER, Ph.D., <i>Associate</i>
ERNEST BARNES LYTLE, Ph.D., <i>Associate</i>
GUSTAF ERIC WAHLIN, Ph.D., <i>Associate</i>
AUBREY JOHN KEMPNER, Ph.D., <i>Instructor</i>
WILLIAM WELLS DENTON, Ph.D., <i>Instructor</i>
EDWARD WILSON CHITTENDEN, Ph.D., <i>Instructor</i>
JOSEPHINE ELIZABETH BURNS, Ph.D., <i>Instructor</i>
CLARENCE MARK HEBBERT, B.S., <i>Assistant</i>
GUY WATSON SMITH, M.S., <i>Assistant</i>
HENRY CHARLES ZEIS, A.B., <i>Assistant</i>
WILLIAM HAROLD WILSON, A.M., <i>Assistant</i>
ROBERT H. MARSHALL, A.B., <i>Assistant</i>
_____, <i>Assistant</i>

Students who select mathematics as a major subject for a bachelor's degree must take Mathematics 7, 9, and twelve hours, chosen either from the courses in mathematics open to undergraduates (with the exception of Mathematics 2, 4, and 8) or from courses open to graduates and undergraduates.

A minor of twenty hours must be selected from the courses offered in astronomy, physics, and chemistry.

2. COLLEGE ALGEBRA.—I or II; (3).

Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	2	3	*A	8	—	8	—	8	—	423 N. H.	Borger
			*B	8	—	8	—	8	—	418 N. H.	Stouffer
			*C	8	—	8	—	8	—	432 N. H.	Kempner
			*D	8	—	8	—	8	—	422 N. H.	Zeis
			*E	8	—	8	—	8	—	419 N. H.	Marshall
			*F	11	—	11	—	11	—	431 N. H.	Townsend
			*G	11	—	11	—	11	—	422 N. H.	Sisam
			*H	11	—	11	—	11	—	434 N. H.	Marshall
			*I	11	—	11	—	11	—	423 N. H.	Burns
			*J	1	—	1	—	1	—	422 N. H.	Zeis
			*K	1	—	1	—	1	—	418 N. H.	Hebbert
			*L	1	—	1	—	1	—	432 N. H.	Smith
			*M	1	—	1	—	1	—	419 N. H.	Wilson
			*N	2	—	2	—	2	—	420 N. H.	Chittenden
			*O	3	—	3	—	3	—	420 N. H.	Chittenden
			*P	3	—	3	—	3	—	418 N. H.	Hebbert
			*Q	3	—	3	—	3	—	419 N. H.	Wilson
			*R	3	—	3	—	3	—	434 N. H.	Burns

*Open to Engineers only.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	2	3	S	9	—	9	—	9	—	420 N. H.	Reed
			T	9	—	9	—	9	—	432 N. H.	Kempner
			U	10	—	10	—	10	—	420 N. H.	Burns
			V	10	—	10	—	10	—	434 N. H.	Lytle
			W	2	—	2	—	2	—	423 N. H.	Wahlin
			X	2	—	2	—	2	—	425 N. H.	Denton
			Y	11	—	11	—	11	—	420 N. H.	Reed

SECOND SEMESTER

A	9	—	9	—	9	—	418 N. H.	Stouffer
B	11	—	11	—	11	—	425 N. H.	Stouffer
C	11	—	11	—	11	—	418 N. H.	Miller
D	3	—	3	—	3	—	423 N. H.	Wahlin

4. PLANE TRIGONOMETRY.—I or II; (2).

Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	4	2	*A	—	8	—	8	—	—	423 N. H.	Borger
			*B	—	8	—	8	—	—	418 N. H.	Stouffer
			*C	—	8	—	8	—	—	432 N. H.	Kempner
			*D	—	8	—	8	—	—	422 N. H.	Zeis
			*E	—	8	—	8	—	—	419 N. H.	Marshall
			*F	—	11	—	11	—	—	431 N. H.	Emch
			*G	—	11	—	11	—	—	422 N. H.	Sisam
			*H	—	11	—	11	—	—	434 N. H.	Marshall
			*I	—	11	—	11	—	—	423 N. H.	Burns
			*J	—	1	—	1	—	—	422 N. H.	Zeis
			*K	—	1	—	1	—	—	418 N. H.	Hebbert
			*L	—	1	—	1	—	—	432 N. H.	Smith
			*M	—	1	—	1	—	—	419 N. H.	Wilson
			*N	—	2	—	2	—	—	420 N. H.	Chittenden
			*O	—	3	—	3	—	—	420 N. H.	Chittenden
			*P	—	3	—	3	—	—	418 N. H.	Hebbert
			*Q	—	3	—	3	—	—	419 N. H.	Wilson
			*R	—	3	—	3	—	—	425 N. H.	Denton
			S	—	9	—	9	—	—	420 N. H.	Reed
			T	—	9	—	9	—	—	418 N. H.	Stouffer
			U	—	10	—	10	—	—	420 N. H.	Burns
			V	—	10	—	10	—	—	434 N. H.	Lytle
			W	—	2	—	2	—	—	423 N. H.	Wahlin
			X	—	2	—	2	—	—	425 N. H.	Denton
			Y	—	11	—	11	—	—	420 N. H.	Reed
			Z	—	11	—	11	—	—	432 N. H.	Kempner

SECOND SEMESTER

A	—	9	—	9	—	—	432 N. H.	Kempner
B	—	11	—	11	—	—	425 N. H.	Stouffer
C	—	11	—	11	—	—	432 N. H.	Kempner
D	—	3	—	3	—	—	423 N. H.	Wahlin
E	—	11	—	11	—	—	434 N. H.	Lytle

5. TEACHERS' COURSE.—Secondary algebra and geometry; their educational value; position in course; methods of teaching; correlation; comparison of American methods with those of foreign countries; order of topics; most important topics; text-books; literature. Lectures; discussions; reports. I; (2).

Prerequisite: Junior standing.

*Open to Engineers only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	5	2	—	—	11	—	11	—	—	435 N. H.	Lytle

6. ANALYTIC GEOMETRY.—Plane and solid analytic geometry. *II*; (5).

Prerequisite: Mathematics 2, 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	6	5	*A	8	8	8	8	8	—	423 N. H.	Borger
			*B	8	8	8	8	8	—	419 N. H.	Chittenden
			*C	8	8	8	8	8	—	432 N. H.	Kempner
			*D	8	8	8	8	8	—	422 N. H.	Zeis
			*E	8	8	8	8	8	—	434 N. H.	Burns
			*F	11	11	11	11	11	—	419 N. H.	Shaw
			*G	11	11	11	11	11	—	420 N. H.	Crathorne
			*H	11	11	11	11	11	—	423 N. H.	Marshall
			*I	11	11	11	11	11	—	422 N. H.	Smith
			*J	1	1	1	1	1	—	422 N. H.	Zeis
			*K	1	1	1	1	1	—	418 N. H.	Hebbert
			*M	1	1	1	1	1	—	419 N. H.	Wilson
			*N	2	2	2	2	2	—	420 N. H.	Chittenden
			*P	3	3	3	3	3	—	418 N. H.	Hebbert
			*Q	3	3	3	3	3	—	419 N. H.	Wilson
			*R	3	3	3	3	3	—	425 N. H.	Denton
			S	9	9	9	9	9	—	420 N. H.	Marshall
			T	9	9	9	9	9	—	431 N. H.	Emch
			U	10	10	10	10	10	—	420 N. H.	Reed
			V	10	10	10	10	10	—	434 N. H.	Lytle
			W	2	2	2	2	2	—	423 N. H.	Wahlin
			X	2	2	2	2	2	—	425 N. H.	Denton

7-9. DIFFERENTIAL AND INTEGRAL CALCULUS.—The principles of the differential and integral calculus developed and applied to functions of one and of several variables. (Section A is an honor section and may be selected by those specializing in mathematics or having an average grade of 90 in freshman mathematics.) *I*; (5); *II*; (3).

NOTE.—Two sections of Mathematics 7 are given the second semester.

Prerequisite: Mathematics 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	7	5	†A	8	8	8	8	8	—	425 N. H.	Rietz
			B	8	8	8	8	8	—	431 N. H.	Emch
			C	8	8	8	8	8	—	420 N. H.	Crathorne
			D	8	8	8	8	8	—	434 N. H.	Lytle
			E	10	10	10	10	10	—	419 N. H.	Shaw
			F	10	10	10	10	10	—	423 N. H.	Borger
			G	10	10	10	10	10	—	432 N. H.	Kempner
			H	10	10	10	10	10	—	422 N. H.	Sisam
			I	10	10	10	10	10	—	431 N. H.	Stouffer
			J	1	1	1	1	1	—	425 N. H.	Denton
			K	1	1	1	1	1	—	420 N. H.	Chittenden
			L	1	1	1	1	1	—	423 N. H.	Wahlin

SECOND SEMESTER

A	1	1	1	1	1	—	434 N. H.	Burns
B	1	1	1	1	1	—	432 N. H.	Smith

*Open to Engineers only.

†Honor section. See conditions given in description of course.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	9	3	A	8	—	8	—	8	—	425 N. H.	Rietz
			B	8	—	8	—	8	—	420 N. H.	Crathorne
			C	8	—	8	—	8	—	431 N. H.	Emch
			D	8	—	8	—	8	—	418 N. H.	Stouffer
			E	9	—	9	—	9	—	432 N. H.	Kempner
			F	9	—	9	—	9	—	423 N. H.	Burns
			G	9	—	9	—	9	—	419 N. H.	Shaw
			H	10	—	10	—	10	—	422 N. H.	Sisam
			I	10	—	10	—	10	—	423 N. H.	Borger
			J	1	—	1	—	1	—	423 N. H.	Wahlin
			K	—	1	—	1	—	10	425 N. H.	Denton
			L	—	1	—	1	—	10	420 N. H.	Chittenden

8. DIFFERENTIAL AND INTEGRAL CALCULUS.—(For students in chemistry and chemical engineering.) *I*; (5).

Prerequisite: Mathematics 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	8	5	A	10	10	10	10	10	—	418 N. H.	Miller
			B	11	11	11	11	11	—	425 N. H.	Smith

9a. DIFFERENTIAL AND INTEGRAL CALCULUS.—(Second Course.) The definite (single and multiple) integral with exercises in the formulation of problems arising in applied mathematics; line, surface, and volume integrals; the theorem of Stokes and Green; partial differentiation; exact differentials with applications of the conditions for exactness; elements of differential questions, approximate quadrature and integration of differential equations. *I*; (2).

Prerequisite: Mathematics 7, 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	9a	2	A	—	10	—	10	—	—	204 T. B.	Crathorne
			B	—	10	—	10	—	—	425 N. H.	Wahlin
			C	—	11	—	11	—	—	204 T. B.	Denton
			D	—	11	—	11	—	—	418 N. H.	Stouffer
			E	—	11	—	11	—	—	419 N. H.	Shaw

10. THEORY OF EQUATIONS AND DETERMINANTS.—Some of the fundamental properties of an algebraic equation in one unknown; the solutions of systems of simultaneous equations; theory of a system of linear equations; some fundamental properties of determinants. *II*; (3).

Prerequisite: Mathematics 6.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	10	3	—	10	—	10	—	10	—	418 N. H.	Miller

16-17. DIFFERENTIAL EQUATIONS AND ADVANCED CALCULUS.—General introduction to ordinary and partial differential equations supplemented by the consideration of special topics of calculus not ordinarily included in a first course, particularly those of value in the applications of mathematics. *I, II*; (3).

Prerequisite: Mathematics 7 and 9, or 8.

27-28. PROJECTIVE GEOMETRY.—Fundamental concepts; anharmonic ratio; projective pencils and ranges; projective transformations and groups; theory of conics and quadric surfaces; pencils and ranges of conics; quadratic transformations and projective theory of cubics; applications in mechanics. *I, II; (3).*

Prerequisite: Senior standing in mathematics.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	27	3	—	1	—	1	—	1	—	435 N. H.	Emch

SECOND SEMESTER

Mathematics 28 3 — Schedule the same as for 27 (first semester).

31. ACTUARIAL THEORY.—Application of probability to life contingencies; mortality tables; fire insurance; premiums for various types of insurance. *I; (3).*

Prerequisite: Mathematics 8, 23.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	31	3	—	9	—	9	—	9	—	207 Com.	Rietz

32. HISTORY OF MATHEMATICS.—Historical development of the elementary subjects; rise and growth of the higher mathematics chiefly in the nineteenth century; biography of the persons most influential in this development. Lectures; reports on assigned reading. *II; (2).*

Prerequisite: Junior standing in mathematics.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	32	2	—	—	11	—	11	—	—	434 N. H.	Lytle

33-34. MODERN ALGEBRA.—Theory of matrices; system of linear equations; bilinear and quadratic forms; properties of polynomials; algebraic invariants; elementary divisors. *I, II; (3).*

Prerequisite: Mathematics 9, 10.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	33	3	—	11	—	11	—	11	—	435 N. H.	Borger

SECOND SEMESTER

Mathematics 34 3 — Schedule the same as for 33 (first semester).

COURSES FOR GRADUATES

100. SEMINAR AND THESIS.—*Three times a week; I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	100	1 or 2 units	—							(Arrange)	Townsend and others

105. CALCULUS OF VARIATIONS.—Those elements of the science that are most needed in the study of the higher subjects of mathematical astronomy and physics. *I, II; (1 unit).*

Prerequisite: Mathematics 16.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	105	1 unit	—	10	—	10	—	10	—	435 N. H.	Crathorne

120. ELEMENTARY THEORY OF GROUPS.—Groups in arithmetic, geometry, and trigonometry; those which can be represented with a small number of letters; the abstract group theory; the Galois theory of equations. *Three times a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	120	1 unit	—	9	—	9	—	9	—	435 N. H.	Miller

131. ALGEBRAIC SURFACES.—Application of homogeneous co-ordinates and the theory of invariants to geometry of three dimensions; general theory of surfaces; special properties of surfaces of the third and fourth order. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 19.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	131	1 unit	—	8	—	8	—	8	—	435 N. H.	Sisam

142. GENERAL ALGEBRA.—Theory of linear associative algebra or hypercomplex numbers, with particular study of the systems useful for the geometry and physics of N dimensions. Applications to relativity theories, and to general differential and integral invariants. Theory of linear operators and functional equations; applications to general analysis, integro-differential equations, infinite systems. General theory of operators; applications to general invariant theories. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 141 or equivalent course.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	142	1 unit	—	2	—	2	—	2	—	419 N. H.	Shaw

MECHANICAL ENGINEERING

CHARLES RUSS RICHARDS, M.M.E., *Professor*
 GEORGE ALFRED GOODENOUGH, M.E., *Professor, Thermodynamics*
 BRUCE WILLET BENEDICT, B.S., *Director, Shop Laboratories*
 LEWIS ALLEN HARDING, M.E., *Professor, Experimental Mechanical Engineering*
 OSCAR ADOLPH LEUTWILER, M.E., *Assistant Professor, Machine Design*
 ARTHUR CUTTS WILLARD, B.S., *Assistant Professor, Heating and Ventilation*
 JOHN ADLUM DENT, M.E., *Associate*
 HARRY FREDERICK GODEKE, B.S., *Instructor*
 HERBERT SETON EAMES, B.S., *Instructor*
 ARTHUR BOQUER DOMONOSKE, M.S., *Instructor, Machine Design*
 HARRY WILLIAM WATERFALL, B.S., *Instructor, Machine Design*
 FREDERICK CALKINS TORRANCE, M.E., *Instructor*
 ALONZO PLUMSTED KRATZ, M.S., *Assistant, Engineering Experiment Station*
 EDGAR THOMAS LANHAM, *Instructor, Forge Work*
 ROBERT EDWIN KENNEDY, *Instructor, Foundry Work*
 GUSTAVE ADOLPH GROSS, *Instructor, Pattern Making*
 GUSTAV HOWARD RADEBAUGH, *Instructor, Machine Work*
 JAMES MERION DUNCAN, *Assistant, Pattern Making*
 PETER JOSEPH REBMAN, *Assistant, Forge Work*
 JOHN ALEXANDER FRISK, *Assistant and Mechanician*

I. STEAM AND AIR MACHINERY.—The construction, operation, and care of boilers, engines, and air compressors; elementary thermodynamics; steam engine performance; transmission of compressed air and its applications. (For students in civil and mining engineering.) *I*; (3).

Prerequisite: Junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	1	3	E	2	—	2	—	2	—	308 E. H.	—
			G	—	8	—	8	—	8	305 E. H.	—

2. STEAM ENGINEERING.—A study of engines, boilers, pumps, condensers, and other steam machinery. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	2	3	C	1	—	1	—	1	—	308 E. H.	—
			D	8	—	8	—	8	—	308 E. H.	—
			K	8	—	8	—	8	—	219 E. H.	—
			L	9	—	9	—	9	—	219 E. H.	—
			M	10	—	10	—	10	—	308 E. H.	—
			N	—	10	—	10	—	10	308 E. H.	—
			P	8-11	—	8-11	—	8-11	—	305 E. H.	—
			Q	1-4	—	1-3	—	1-4	—	305 E. H.	—

4. ELEMENTS OF MACHINE DESIGN.—Design of machine elements: bolts, keys, journals, bearings, couplings; forms of gear teeth; spur and bevel gears. *I*; (2).

Prerequisite: General Engineering Drawing 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	4	2	P	8-11	—	8-10	—	8-11	—	309 E. H.	—
			Q	—	1-4	—	1-4	—	10-12	312 E. H.	—

6a. HEAT ENGINES.—Flow of fluids; steam turbine; air compressors and refrigerating machinery. *I*; (3).

Prerequisite: Mechanical Engineering 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	6a	3	P	11	—	11	—	11	—	308 E. H.	—
			Q	9	—	9	—	9	—	308 E. H.	—

6b. GAS ENGINES.—Types of gas engines; mixtures of gases; combustion of gaseous fuels; gas producers. *II*; (2).

Prerequisite: Mechanical Engineering 6a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	6b	2	P	—	9	—	9	—	—	305 E. H.	—
			Q	—	8	—	8	—	—	305 E. H.	—

8. MECHANICS OF MACHINERY.—Friction in machine parts; useful application of friction as in friction clutches and brakes; transmission of power by ropes and belting; brakes, clutches, and dynamometers; hoisting machinery; hoisting in mines; elevators and cranes. *I*; (3).

Prerequisite: Theoretical and Applied Mechanics 29, 27; Mechanical Engineering 30, 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	8	3	P	9	—	9	—	9	—	305 E. H.	—
			Q	10	—	10	—	10	—	305 E. H.	—

9. MACHINE DESIGN.—Theory of machine design, with applications; investigation of actual machine similar to the one to be designed; design of machinery subjected to heavy and variable stresses; punches, shears, presses, riveters, and cranes. *I*; (3).

Prerequisite: Theoretical and Applied Mechanics 21, 29; Mechanical Engineering 4, 30.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	9	3	PQ	1-4	—	1-4	—	1-4	—	309 E. H.	—
										314 E. H.	—

12. THERMODYNAMICS.—The transformation of heat into work; the second law and its connection with irreversible processes; the properties of heat media; the perfect gases; saturated and superheated vapors; the flow of fluids. *II*; (5).

Prerequisite: Mathematics 9a; Theoretical and Applied Mechanics 27.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	12	5	P	9	9	9	9	9	—	308 E. H.	—
			Q	11	11	11	11	11	—	308 E. H.	—

13. MECHANICAL ENGINEERING LABORATORY.—The testing and calibration of instruments and apparatus; use of the indicator; calculation of horse-power and steam consumption; reading of indicator diagrams; valve setting. (For students in electrical engineering.) *II*; (3).

Prerequisite: Mechanical Engineering I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	13	3	T	—	9-12	—	9-12	—	—	M. L.	—

15. THERMODYNAMICS AND HEAT ENGINES.—(For students in electrical engineering.) *I*; (5).

Prerequisite: Mechanical Engineering I or 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	15	5	KM	11	11	11	11	11	—	305 E. H.	—
			LN	10	10	10	10	10	—	308 E. H.	—

19. SEMINAR.—Papers on subjects relating to current engineering practise; the indexing of current engineering literature. Each student subscribes for a technical journal. Open to seniors only. *I*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	19	1	PQ	—	—	—	—	—	9-11	M. L.	—

25. HEATING AND VENTILATION FOR ARCHITECTS.—The theory and the application of the principles of heating and ventilation to modern practise. Direct and indirect steam and hot water heating; furnace heating; ventilation and air analysis; air conditioning; temperature and humidity control. *I*; (2).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	25	2	A	10	—	10	—	—	—	M. L.	—

26. HEATING AND VENTILATION.—The theory and the application of the principles of heating and ventilation to modern practise. Steam boilers and water heaters of steel and cast iron for heating service; heat losses from buildings; direct and indirect steam and hot water heating, using gravity systems; furnace heating; fan blast or mechanical indirect systems; exhaust steam heating; district heating by steam and water; ventilation and air analysis; air conditioning; temperature and humidity control. *I* or *II*; (3).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	26	3	C	11	—	11	—	11	—	M. L.	—

SECOND SEMESTER

PQ	11	—	11	—	11	—	M. L.	—
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30. MECHANICS OF MACHINERY.—Mechanisms and mechanical movements, including cams, gears, valve gears, and quick-return motions; graphical constructions for displacement, velocity, and acceleration; kinetics of the steam

engine mechanism and similar mechanisms; balancing; critical speeds; force and mass reduction. *II*; (5).

Prerequisite: Theoretical and Applied Mechanics 27.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	30	5	P	11	11	11	11	11	—	305 E. H.	—
			Q	10	10	10	10	10	—	305 E. H.	—

36. INDUSTRIAL PLANT DESIGN.—Theory and practise in the design and equipment of industrial plants. Design of buildings, heating, ventilation, lighting, power generation, and transmission; drying processes, etc. *II*; (3).

Prerequisite: Mechanical Engineering 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	36	3	PQ	1-4	—	1-4	—	8-11	—	312 E. H.	—

[37. SCIENCE OF MANAGEMENT.—Historical review of industrial development; modern industrial tendencies; principles of organization; selection and compensation of labor; application of science to industrial problems; practical shop systems of management; production; etc. *I*; (3). Not given, 1914-15.

Prerequisite: Mechanical Engineering 81, 82.]

52. POWER PLANT DESIGN.—Study and design of some form of steam power plant. *II*; (3).

Prerequisite: Mechanical Engineering 9 and 65.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	52	3	PQ	8-11	—	8-11	—	8-11	—	309 E. H.	—
										312 E. H.	—

64. POWER MEASUREMENT.—The apparatus used in engine and boiler tests—scales, thermometers, indicators, brakes and dynamometers, gauges, calorimeters; methods of calibrating and using such apparatus; tests for horse-power of steam engines, pumps, and gas engines. Reports. *II*; (3).

Prerequisite: Mechanical Engineering 2; Mathematics 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	64	3	P	1-4	—	—	—	1-4	—	M. L.	—
			Q	—	1-4	—	1-4	—	—	M. L.	—

65. MECHANICAL ENGINEERING LABORATORY.—Experiments on engines, turbines, gas engines, pumps, boilers, injectors, air compressors, hoisting appliances, heating apparatus, and the refrigerating machines. Tests of power plants in the vicinity. *I*; (3).

Prerequisite: Mechanical Engineering 64, 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	65	3	P	1-5	—	1-5	—	—	—	M. L.	—
			Q	8-12	—	8-12	—	—	—	M. L.	—

66. **ADVANCED LABORATORY PRACTISE.**—Special research work in the mechanical engineering laboratory. Open to seniors only. *Time will be arranged by consultation. II; (2).*

Prerequisite: Mechanical Engineering 65.

67. **HEATING AND VENTILATING LABORATORY.**—Calibration of instruments; performance and efficiency tests of radiators, heating boilers, heat and vent flues, centrifugal fans, and air washer; heat transmission tests of building materials; tests to determine pressure drop in pipe lines for air and water. *I; (1).*

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	67	1	C	—	—	—	—	—	8-11	M. L.	—

71. **FORGE WORK FOR AGRICULTURAL STUDENTS.**—Forging and welding; tempering tools; pointing and hardening cultivator shovels, plow shares. *Six hours a week, either half of I or II; (1). Arrange time.*

73. **WOOD WORK FOR AGRICULTURAL STUDENTS.**—Carpentry for the farmer: use of tools; layout and construction of building joints; repairs to buildings and equipment. *Six hours a week, either half of I or II; (1). Arrange time.*

75. **FORGE WORK.**—(9 weeks). Hand and power forging and welding of metals; heat treatment of carbon and high speed steels in modern, gas, electric, and cyanide furnaces; case carbonizing. *I or II; (1).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	75	1	A	8-11	—	8-10	—	8-11	—	M. S.	—
			B	—	8-11	—	8-11	—	8-10	M. S.	—

SECOND SEMESTER

A	8-11	—	8-10	—	8-11	—	M. S.	—
B	—	8-11	—	8-11	—	8-10	M. S.	—

77. **FOUNDRY WORK.**—(9 weeks). Modern foundry practise, including bench, floor, and machine moulding; all branches of core making; operation of cupola and brass furnace; casting of iron, brass, and alloys. *I or II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	77	2	A	8-11	—	8-10	—	8-11	—	M. S.	—
			B	—	8-11	—	8-11	—	8-10		

SECOND SEMESTER

A	8-11	—	8-10	—	8-11	—	W. S.	—
B	—	8-11	—	8-11	—	8-10	W. S.	—

79. **PATTERN WORK.**—(18 weeks). Hand and machine methods in the production of useful patterns. *I or II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	79	3	A	8-11	—	8-10	—	8-11	—	W. S.	—
			B	—	8-11	—	8-11	—	8-10	W. S.	—

SECOND SEMESTER

A	8-11	—	8-10	—	8-11	—	W. S.	—
B	—	8-11	—	8-11	—	8-10	W. S.	—

81. MACHINE WORK.—Modern machine shop manufacturing methods; machine operation; training in shop management; organization; production methods; despatching work; ordering, storing, and routing materials; time studies; shop accounting; inspection and all activities of the machine department of a manufacturing plant. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	81	3	KL	8-11	—	8-10	—	8-11	—	M. S.	—
			MN	—	1-4	—	1-4	—	10-12	M. S.	—
			P	—	8-11	—	8-11	—	8-10	M. S.	—
			Q	1-4	—	1-3	—	1-4	—	M. S.	—

82. MACHINE WORK.—(Continuation of 81.) *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	82	2	P	—	8-11	—	8-11	—	8-10	M. S.	—
			Q	—	1-4	—	1-4	—	10-12	M. S.	—

99. THESIS.—Investigation of special subject and preparation of thesis embodying a review of the literature of the subject, the results of investigation, and a discussion of those results. *II*; (3).

COURSES FOR GRADUATES

Entrance upon graduate work in mechanical engineering presupposes the full undergraduate course in that subject.

106. HEAT MOTORS.—The advanced theory of the internal combustion motor, and of the steam turbine. The general principles and methods of refrigeration. *Twice a week; II*; (1 unit). *Arrange*.

107. THERMODYNAMICS.—The general principles of thermodynamics and their application to the solution of physical and engineering problems. *Twice a week; I*; (1 unit). *Arrange*.

109. MACHINE DESIGN.—The general principles of rational design; the application of mechanics of materials. Individual problems. *Twice a week; I or II*; (1 unit). *Arrange*.

112. LABORATORY INVESTIGATION.—Special investigations of problems relating to combustion of fuel; boiler economy; steam engines and turbines; gas engines and producers; properties of explosive mixtures; mechanical refrigeration. Original work. *Three times a week; I, II*; (1½ units). *Arrange*.

114. DYNAMICS OF MACHINERY.—Advanced problems. Balancing; whirling and vibration of shafts; theory of governors; fly wheels; force and mass reduction; stresses in rotating masses. *Twice a week; I, II*; (1 unit).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	114	1 unit	—							(Arrange)	Goodenough

MECHANICS, THEORETICAL AND APPLIED

ARTHUR NEWELL TALBOT, C.E., *Professor, Municipal and Sanitary Engineering; in charge of Theoretical and Applied Mechanics*

HERBERT FISHER MOORE, M.M.E., *Professor*

MELVIN LORENIUS ENGER, C.E., *Assistant Professor*

VIRGIL R FLEMING, B.S., *Associate*

CLARENCE EUGENE NOERENBERG, A.B., A.E., *Instructor*

FRED B SEELY, B.S., *Instructor*

GEORGE PAUL BOOMSLITER, M.S., *Instructor*

HARRISON FREDERICK GONNERMAN, B.S., *Instructor*

NEWTON EDWARD ENSIGN, A.B., B.S., *Instructor*

HARRY GARDNER, M.S., *Instructor*

ALEX VALLANCE, M.E., *Instructor*

10. HYDRAULICS.—The pressure and the flow of water and its utilization as motive power; observation and measurement of pressure, velocity, and flow; power and efficiency; determination of experimental coefficients. Hoskins' *Hydraulics. Laboratory weekly; II; (3).*

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 21.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	10	3	E	—	1	—	1	—	—	302 L.A.M.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Moore Enger Fleming Seely Gonnerman Gardner Vallance </div> </div>
			Lab.	—	—	—	—	—	10-12	L.A.M.	
			F	—	—	10	—	10	—	219 E. H.	
			Lab.	10-12	—	—	—	—	—	L.A.M.	
			G	—	9	—	9	—	—	202 E. H.	
			Lab.	—	10-12	—	—	—	—	L.A.M.	
			H	—	11	—	11	—	—	202 L.A.M.	
			Lab.	8-10	—	—	—	—	—	L.A.M.	

14. ELEMENTS OF MECHANICS.—Kinematics, kinetics, and statics. (For architects and others who have not taken the calculus.) Morley's *Mechanics for Engineers. II; (4).*

Prerequisite: Mathematics 2, 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	14	4	13	—	1	1	1	1	—	202 L.A.M.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Boomsliter Gardner </div> </div>
			14	—	8	8	8	8	—	201 E. H.	
			15	—	—	8	8	8	8	104 P. L.	
			X	11	11	11	11	—	—	302 L.A.M.	

15-16. STRENGTH OF MATERIALS.—Graphical methods of determining the elastic curve of beams; centroids and moments of inertia of areas; reinforced concrete beams and columns; properties and tests of engineering materials. (For students in architecture and others without the prerequisites required for Theoretical and Applied Mechanics 29.) Murdock's *Strength of Materials. Laboratory every other week; I, II; (3).*

Prerequisite: Theoretical and Applied Mechanics 14.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	15	3	A	10	—	10	—	10-12	—	202 L.A.M.	Noerenberg
			B ₁	—	10	—	10	—	10-12	202 L.A.M.	Boomsliter
			B ₂	—	10	—	10	—	10-12	302 L.A.M.	Vallance
			X	—	8	—	8	—	8-10	302 L.A.M.	Seely

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	16	3	A	10	—	10	—	10-12	—	302 L.A.M.	Noerenberg
			B ₁	—	10	—	10	—	10-12	302 L.A.M.	Boomsliter
			B ₂	—	10	—	10	—	10-12	202 L.A.M.	Seely
											Vallance

20. ANALYTICAL MECHANICS.—The mechanics of engineering rather than that of astronomy and physics. Fundamental concepts; equilibrium, centroids and center of gravity, friction; engineering problems; statement of conditions and use of data. Maurer's *Technical Mechanics*. II; (3).

Prerequisite: Mathematics 7, registration in Mathematics 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	20	3	C	—	11	—	11	—	11	202 E. H.	Noerenberg Ensign Gonnerman Gardner Vallance
			D	—	11	—	11	—	11	201 E. H.	
			E	—	1	—	1	—	9	202 E. H.	
			F	8	—	8	—	8	—	202 L.A.M.	
			G	—	8	—	8	—	8	202 L.A.M.	
			K	1	—	1	—	1	—	202 E. H.	
			L	—	9	—	9	—	9	202 L.A.M.	
			M	8	—	8	—	8	—	211 E. H.	
			N	—	10	—	10	—	10	202 E. H.	
			P	1	—	1	—	1	—	201 E. H.	
			Q	10	—	10	—	10	—	205 E. H.	
			Y	10	—	10	—	10	—	201 E. H.	
			Z	10	—	10	—	10	—	202 E. H.	

21. ANALYTICAL MECHANICS.—Continuation of Theoretical and Applied Mechanics 20. Kinematics and kinetics. Maurer's *Technical Mechanics*. I; (2).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	21	2	E	—	8	—	8	—	—	219 E. H.	Noerenberg Ensign Gonnerman Gardner
			F	—	8	—	8	—	—	211 E. H.	
			G	—	10	—	10	—	—	202 E. H.	
			H	—	10	—	10	—	—	211 E. H.	
			Z	—	10	—	10	—	—	201 E. H.	

25. RESISTANCE OF MATERIALS.—A briefer course than Theoretical and Applied Mechanics 20. (For students in architectural engineering, electrical engineering, and mining engineering.) Merriman's *Mechanics of Materials*. I; (4).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	25	4	C	11	—	11	—	11	—	302 L.A.M.	Enger Fleming Noerenberg Boomsliiter Seely Ensign Gonnerman Gardner Vallance
			Lab.	1-3	—	—	—	—	—	—	
			D	11	—	11	—	11	—	202 E. H.	
			Lab.	—	—	1-3	—	—	—	—	
			K	10	—	10	—	10	—	302 L.A.M.	
			Lab.	—	—	—	—	8-10	—	—	
			L	8	—	8	—	8	—	202 L.A.M.	
			Lab.	—	—	—	—	1-3	—	—	
			M	8	—	8	—	8	—	202 E. H.	
			Lab.	10-12	—	—	—	—	—	—	
			N	8	—	8	—	8	—	104 P. L.	
			Lab.	—	—	10-12	—	—	—	—	
			Z	10	—	10	—	10	—	201 E. H.	
			Lab.	—	—	—	—	—	8-10	—	

26. KINETICS AND HYDRAULICS.—The principles of kinematics, kinetics, and hydraulics; problems; experiments in the hydraulic laboratory. (For students in architectural engineering, electrical engineering, and mining engineering.) Maurer's *Technical Mechanics*, Hoskins' *Text-Book on Hydraulics*. Laboratory weekly during the last half of semester. II; (4).

Prerequisite: Theoretical and Applied Mechanics 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	26	4	C	11	—	11	—	11	—	202 E. H.	Enger Fleming Seely Gonnerman Vallance
			Lab.	—	—	—	—	—	8-10	208 E. H.	
			D	11	—	11	—	11	—	202 L.A.M.	
			Lab.	—	—	—	10-12	—	—	205 E. H.	
			K	9	—	9	—	9	—	202 E. H.	
			Lab.	—	—	—	—	1-3	—	302 L.A.M.	
			L	8	—	8	—	8	—	202 E. H.	
			Lab.	—	1-3	—	—	—	—	208 E. H.	
			M	8	—	8	—	8	—	302 L.A.M.	
			Lab.	1-3	—	—	—	—	—	302 L.A.M.	
			N	10	—	10	—	10	—	202 L.A.M.	
			Lab.	—	—	1-3	—	—	—	302 L.A.M.	

27. ANALYTICAL MECHANICS.—Kinetics and kinematics. A longer course than Theoretical and Applied Mechanics 21. (To be given to mechanical engineering students during the transition period of changing courses.) Slocum's *Theory and Practise of Mechanics*. I; (3).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	27	3	P	9	—	9	—	9	—	202 E. H.	Enger
			Q	9	—	9	—	9	—	202 E. H.	Seely
			Y	9	—	9	—	9	—	211 E. H.	Ensign

29. RESISTANCE OF MATERIALS.—The mechanics of materials; the properties and requirements for materials of construction; the effect of methods of manufacture upon the quality of the material; specifications and standard tests; experiments and investigations in the materials laboratory. (For students in civil engineering, mechanical engineering, and municipal and sanitary engineering.) Merriman's *Mechanics of Materials*: Recitations, lectures, and assigned reading; laboratory weekly. I; (5).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20; registration in Theoretical and Applied Mechanics 21.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	29	5	*Lecture	—	—	11	—	—	—	100 Com.	Talbot Moore Noerenberg Boomslicer Seely Ensign Gonnerman Gardner Vallance
			E	8	—	8	—	8	—	219 E. H.	
			Lab.	—	10-12	—	—	—	—	L.A.M.	
			F	8	—	8	—	8	—	211 E. H.	
			Lab.	—	—	—	10-12	—	—	L.A.M.	
			G	10	—	10	—	10	—	202 E. H.	
			Lab.	8-10	—	—	—	—	—	L.A.M.	
			H	10	—	10	—	10	—	211 E. H.	
			Lab.	—	—	8-10	—	—	—	L.A.M.	
			P	—	8	—	8	—	8	202 E. H.	
			Lab.	—	—	—	1-3	—	—	L.A.M.	
			Q	—	8	—	8	—	8	202 L.A.M.	
			Lab.	—	1-3	—	—	—	—		

COURSES FOR GRADUATES

Entrance upon graduate work in theoretical and applied mechanics presupposes a full undergraduate course in that subject.

101. ANALYTICAL MECHANICS.—Methods of treatment and attack; the more complex problems and applications; critical and comparative study of texts. *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	101	1 unit	—							(Arrange)	Moore

102. RESISTANCE OF MATERIALS.—Properties of materials used in engineering construction and the methods of determining these properties; analysis and investigation in mechanics of materials; the effect of form of member in a structure or machine; the method of application of forces; comparative study of texts. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	102	1 unit	—							(Arrange)	Moore

103. HYDRAULICS AND HYDRAULIC ENGINEERING.—The laws of hydraulics and their application to engineering problems; hydraulic power and its development; design and investigation. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	103	1 unit	—							(Arrange)	Talbot

104. EXPERIMENTAL WORK IN THE LABORATORY OF APPLIED MECHANICS.—Investigation in the materials testing laboratory on materials and on their action as used in machines and structures; experiments in the hydraulic laboratory with pumps, motors, and measuring devices, and the investigation of the laws of hydraulics, the development of power, and the study of various hydraulic problems. *Twice a week; I, II; (½ to 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	104	½ to 2	—							(Arrange)	Talbot, Moore

105. EXPERIMENTAL AND ANALYTICAL WORK IN REINFORCED CONCRETE.—Research: interpretation of available experimental results and their application

*Each student taking the course must enroll in the lecture section.

to the design of structures; principles of construction; typical reinforced concrete structures. *Twice a week. I, II; (½ unit or more).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	105	½ unit or more	—							(Arrange)	Talbot

MILITARY SCIENCE

FRANK DANIEL WEBSTER, Major 20th U. S. Infantry, *Professor and Commandant*

FREDERICK WILLIAM POST, 1st Sergeant, U. S. A., retired, *Administrative Assistant*

I. THEORETICAL INSTRUCTION.—Infantry Drill Regulations. For all freshmen men. *II; (1).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	1	1	A	11	—	—	—	—	—	—	Webster
			B	—	11	—	—	—	—	—	Webster
			C	—	—	11	—	—	—	—	Webster
			D	—	—	—	11	—	—	—	Webster
			E	—	—	—	—	11	—	—	Webster
			F	3	—	—	—	—	—	—	Webster
			G	—	3	—	—	—	—	—	Webster
			H	—	—	3	—	—	—	—	Webster
			I	—	—	—	3	—	—	—	Webster
			J	—	—	—	—	3	—	—	Webster

2a-2b-2c-2d. PRACTICAL INSTRUCTION.—*Infantry*.—School of the soldier; company and battalion; regimental ceremonies. *Artillery*.—School of the cannoneer and battery dismounted. Freshmen and sophomore years. One and one-half hours' drill each week until March 15; after that date, three hours each week. *I, II; (1).*

FIRST SEMESTER (FRESHMEN)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	2a	1	(See Note)	4	4	4	4	—	—	Armory	Webster

SECOND SEMESTER (FRESHMEN)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	2b	1	(See Note)	4	4	4	4	—	—	Armory	Webster

NOTE.—Freshmen must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions in the regiment will be made by the Commandant.

FIRST SEMESTER (SOPHOMORES)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	2c	1	(See Note)	4	4	4	4	—	—	Armory	Webster

SECOND SEMESTER (SOPHOMORES)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	2d	1	(See Note)	4	4	4	4	—	—	Armory	Webster

NOTE.—Sophomores must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions are made by the Commandant according to circumstances.

3. MINING PRINCIPLES.—Terminology; explosives; blasting; drilling; tunneling; shaft-sinking; mining and timbering of flat deposits. (For students in ceramics, and engineering courses other than mining.) *I*; (2).

Prerequisite: Chemistry 1a or 1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	3	2	—	8	—	8	—	—	—	206 T. B.	Callen

4. MINING METHODS.—Mining and timbering of bedded, vein, and placer deposits. *II*; (2).

Prerequisite: Mining Engineering 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	4	2	—	—	11	—	8	—	—	206 T. B.	Stoek, Andros

5. MINE VENTILATION.—Mine gases; safety lamps; mine ventilation; mine lighting; explosions in mines; mine fires; rescue work; first aid. *I*; (2).

Professor STOEK, Mr. ANDROS

Prerequisite: Chemistry 1a or 1b.

(Not regularly given 1914-15, on account of change in course. May be given if sufficient number apply.)

6a-6b. MECHANICAL ENGINEERING OF MINES.—Hoisting: ropes, cages, hoisting engines, and other appliances. Haulage: the different systems used underground and on the surface; the methods of loading and unloading; mine stables; transportation of workmen. Signaling. Drainage of mines: mine dams, mine pumps. *I*; (3), *II*; (2).

Prerequisite: Mechanical Engineering I, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	6a	3	A	—	8-10	—	8-10	—	8-10	206 T. B.	Callen

SECOND SEMESTER

Min. E.	6b	2	B	—	8-10	—	—	—	8-10	206 T. B.	Callen
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8. MINE ADMINISTRATION, ORGANIZATION, AND MINING LAW.—Mining companies. Trade agreements—relations between employers and employees. Transportation and marketing. The general mining laws of the several states, with particular attention to those of Illinois. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	8	3	—	8	—	8	—	8	—	207 T. B.	Stoek

9. PREPARATION OF COAL AND ORES.—Coal washing: history, application, principles, processes, and machines used in the preparation and washing of anthracite and bituminous coal; American and foreign practise; principles and machines used in breaking, pulverizing, and concentrating ores and mineral products. *I*; (3).

Prerequisite: Chemistry 1a or 1b, 2 and 3; Physics 1a-1b and 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	9	3	—	10	—	1-4	—	10	—	207 T. B.	Holbrook

13. UTILIZATION OF FUELS.—The manufacture, handling, and utilization of wood, charcoal, peat, lignite, bituminous coal, anthracite, coke, petroleum, natural and artificial gas, and refractories in mining and metallurgical practise. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	13	2	—	—	—	11	—	11	—	207 T. B.	Holbrook

41. MINE DESIGN.—General theory of framed structures; design of mine structures of wood, steel, and masonry. Tipple arrangements; rock houses; ore bins; general surface plant; design and drafting of mining and metallurgical plant. *I*; (3).

Prerequisite: Civil Engineering 60.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	41	3	—	8-10	—	8-10	—	8-10	—	207 T. B.	Holbrook

42. MINE PLANT.—General layout; design; estimates for construction; specifications for mining and metallurgical plants. *II*; (2).

Prerequisite: Mining Engineering 41.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	42	2	—	10-12	—	—	1-3	—	—	207 T. B.	Holbrook

62. MINE SURVEYING.—The application of general surveying methods to mine work; the description and use of instruments employed underground and in connecting surface and underground surveys; the platting and use of mine maps; mineral land surveying; the theory and use of solar attachments; determination of the meridian; theory and use of stadia; application of topographic and railroad surveying to mining conditions; estimation and prospecting of mineral deposits. *II*; (4).

Prerequisite: Civil Engineering 27.

(Not regularly given 1914-15 on account of change in course. May be given if sufficient number apply.)

64. MINING LABORATORY.—Different coals, and their availability for washing; complete commercial tests, using small commercial machines wherever possible; design of flow sheets; analysis of products; briquetting of fuels; concentration tests on a lead, zinc, or iron ore; amalgamation and cyanidation of a gold ore. *II*; (2).

Prerequisite: Mining Engineering 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	64	2	—	—	8-12	—	—	—	—	Min. Lab.	Holbrook
				—	1-4	—	—	—	—		

90. SEMINAR.—Review of mining literature; reports: *II*; (1).

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Min. E.	90	1	—	—	—	—	—	9	—	206 T. B.	—

91. SEMINAR.—Review of mining literature; reports: *I*; (1).

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Min. E.	91	1	—	—	11	—	—	—	—	206 T. B.	Stoek

100. THESIS.—Individual investigation of a special mining subject; preparation of thesis giving review of the literature on the subject, the results of experimental work, and a general discussion of the subject. *II*; (3).

(Hours arranged when thesis is permitted, in accordance with regulations of the College of Engineering.)

COURSES FOR GRADUATES

Entrance upon graduate work in mining engineering presupposes a full undergraduate course in that subject.

101. ADVANCED MINING METHODS.—Coal and ore fields of the United States; methods and economics of mining: utilization, marketing, storage, and transportation of coal and ores. *Twice a week*; *I*, *II*; (1 unit).

BOTH SEMESTERS

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Min. E.	101	1 unit	—							(Arrange)	Stoek

102. ADVANCED PREPARATION OF COAL AND ORES.—Detailed investigation and discussion of settling ratios, laws of crushing, sorting vs. sizing, etc.; specific mill and washing problems. *Twice a week*; *I*, *II*; (1 unit).

BOTH SEMESTERS

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Min. E.	102	1 unit	—							(Arrange)	Holbrook

103. THE HISTORY OF MINERS' ORGANIZATIONS WITH ESPECIAL REFERENCE TO THEIR EFFECT UPON THE DEVELOPMENT OF MINING PRACTISE.—*Twice a week*; *I*; (1 unit).

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Min. E.	103	1 unit	—							(Arrange)	—

104. MINING REPORTS.—A detailed study of the law of the apex, the classification of coal and ore lands, and the several items entering into a mine examination and report. *Twice a week*; *I*; (1 unit).

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Min. E.	104	1 unit	—							(Arrange)	Stoek, Holbrook

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
M. & S. E.	6b	2	—	8	—	—	—	9-12	—	208 E. H.	<div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 3em; vertical-align: middle; margin-right: 5px;">}</div> <div style="display: inline-block; vertical-align: middle;"> Talbot Babbitt Hansen </div> </div>

Prerequisite: Theoretical and Applied Mechanics 10; Chemistry 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	7	4	—							(Arrange)	W. Babbitt

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	8	3	—							(Arrange)	Babbitt

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
M. & S. E.	9	2	—	—	—	2-4	—	2-4	—	208 E. H.	Enger

COURSES FOR GRADUATES

102. WATER SUPPLY ENGINEERING.—Sources and requirements of water supply; general water-works construction; pumps and pumping; design of reservoirs and elevated tanks; water-works operation and the valuation of plants. *One to three times a week; I or II; (1 unit).*

EITHER SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
M. & S. E.	102	1 unit	—						(Arrange)		Talbot

103. SEWERAGE.—General sewerage design and construction; sewerage systems; hydraulics of sewers; a study of run-off. *Once or twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	103	1 unit	—						(Arrange)		Talbot

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	106	½ unit	—						(Arrange)		Talbot

JOHN LAWRENCE ERB, F.A.G.O., *Director*

CONSTANCE BARLOW-SMITH, *Assistant Professor, Sight-Singing, Ear Training,
Public School Music*

HENRI JACOBUS VAN DEN BERG, *Instructor, Piano*

ALBERT AUSTIN HARDING, *Instructor, Wind Instruments, Director of the Band*

FLORENCE MARY KIRKUP, *Instructor, Voice*

EDNA ALMEDA TREAT, Mus.B., *Instructor, Piano*

EDSON WILFRED MORPHY, *Instructor, Violin*

LOWELL LESLIE TOWNSEND, A.M., *Instructor, Piano*

HEBER DIGNAM NASMYTH, *Instructor, Voice*

ANNA VIOLA SIMON, *Instructor, Voice*

I-2. HISTORY OF MUSIC.—I, II; (2).

Prerequisite: 1 year of college work.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Music	1	2	—	—	11	—	11	—	—	102 U. H.	Schwartz

SECOND SEMESTER

Music	2	2	—	Schedule the same as for 1 (first semester).
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3-4. THEORY OF MUSIC.—*I, II; (2).*

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Music	3	2	A	—	8	—	8	—	—	102 U. H.	} Schwartz
			B	—	2	—	2	—	—	102 U. H.	
			C	—	3	—	3	—	—	102 U. H.	

SECOND SEMESTER

Music	4	2	—	Schedule the same as for 3 (first semester).
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5-6. THEORY OF MUSIC.—Continuation of 3-4. *I, II; (3).*

Prerequisite: Music 3-4.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Music	5	3	A	2	—	2	—	2	—	102 U. H.	Schwartz
			B	3	—	3	—	3	—	102 U. H.	Schwartz

SECOND SEMESTER

Music	6	3	—	Sections and schedule the same as for 5 (first semester).
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7-8. COUNTERPOINT, CANON, AND FUGUE.—*I, II; (3).*

Prerequisite: Music 5-6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	7	3	—	11	—	11	—	11	—	102 U. II.	—

SECOND SEMESTER

Music	8	3	—	Schedule the same as for 7 (first semester).
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9-10. GENERAL ANALYSIS.—*I, II; (2).**Prerequisite:* Music 7-8.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	9	2	—	—	10	—	10	—	—	102 U. H.
Instructor Schwartz										

SECOND SEMESTER

Music 10 2 — Schedule the same as for 9 (first semester).

11-12. ACOUSTICS.—*I, II; (1).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	11	1	—	—	—	—	—	9	—	—
Instructor Schwartz										

SECOND SEMESTER

Music 12 1 — Schedule the same as for 11 (first semester).

12-13. SOUND AND ITS APPLICATION TO MUSIC.—*I, II; (1).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	12	1	—	—	—	—	—	9	—	126 U. H.
Instructor —										

SECOND SEMESTER

Music 13 1 — — — — 9 — 126 U. H. —

PUBLIC SCHOOL MUSIC

21a-21b. EAR TRAINING, FIRST YEAR.—Two hours a week; required of all music students. *I, II; (no credit).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	21a	—	—	9	—	9	—	—	—	126 U. H.
Instructor Schwartz										

SECOND SEMESTER

Music 21b — — Schedule the same as for 21a (first semester).

22a-22b. EAR TRAINING, SECOND YEAR.—Two hours a week; required of students in the course in Music in the sophomore year, and of students in the course in Public School Music. *I, II; (1).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	22a	1	—	—	9	—	9	—	—	126 U. H.
Instructor Smith										

SECOND SEMESTER

Music 22b 1 — Schedule the same as for 22a (first semester).

23a-23b. SIGHT SINGING, FIRST YEAR.—Two hours a week; required of students in the course in Music in the sophomore year, and of students in the course in Public School Music. *I, II; (no credit).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	23a	—	—	10	—	10	—	—	—	126 U. H.
Instructor Smith										

SECOND SEMESTER

Music 23b — — Schedule the same as for 23a (first semester).

24a-24b. SIGHT SINGING, SECOND YEAR.—Two hours a week; required of students in the course in Music in the junior year, and of students in the course in Public School Music. *I, II; (1).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	24a	1	—							(Arrange)	—

SECOND SEMESTER

Music	24b	1	—	Schedule the same as for 24a (first semester).							
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25a-25b. METHODS OF TEACHING.—Elements of theory, eye and ear training, the limitations of the child-voice, selection of material, pedagogical presentations, appreciation work for the high school. (Offered primarily for students who desire to teach music successfully in the public schools.) *I, II; (4).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	25a	4	—	2	2	2	2	—	—	126 U. H.	Smith

SECOND SEMESTER

Music	25b	4	—	Schedule the same as for 25a (first semester).							
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PIANO

Mr. VAN DEN BERG, Mr. TOWNSEND, Miss TREAT

Hours to be arranged.

(In registering for the first semester use the first of the two hyphenated numbers attached to each course, and in registering for the second semester use the second number; for example, register for Music 41a for the first semester, and for Music 41b for the second semester.)

41a-41b. PREPARATORY COURSE IN PIANO, FIRST YEAR.—*I, II.* (No collegiate credit).

41c-41d. PREPARATORY COURSE IN PIANO, SECOND YEAR.—*I, II.* (No collegiate credit).

41e-41f. PREPARATORY COURSE IN PIANO, THIRD YEAR.—*I, II.* (No collegiate credit).

42a-42b. PIANO, FIRST YEAR.—*I, II; (6).*

43a-43b. PIANO, SECOND YEAR.—*I, II; (6).*

44a-44b. PIANO, THIRD YEAR.—*I, II; (6).*

45a-45b. PIANO, FOURTH YEAR.—*I, II; (6).*

46a-46b. PIANO, ONE YEAR.—The first year's work in piano taken as a minor by senior collegiate students majoring in voice or violin. *I, II; (2).*

47a-47b. PIANO.—For students from other departments of the University. *I, II; (no credit).*

VOICE

Mr. NASMYTH, Miss KIRKUP, Miss SIMÓN

Hours to be arranged.

(See note above, under courses in piano.)

51a-51b. PREPARATORY COURSE IN VOICE, FIRST YEAR.—*I, II; (no collegiate credit).*

51c-51d. PREPARATORY COURSE IN VOICE, SECOND YEAR.—*I, II*; (no collegiate credit).

51e-51f. PREPARATORY COURSE IN VOICE, THIRD YEAR.—*I, II*; (no collegiate credit).

52a-52b. VOICE, FIRST YEAR.—*I, II*; (6).

53a-53b. VOICE, SECOND YEAR.—*I, II*; (6).

54a-54b. VOICE, THIRD YEAR.—*I, II*; (6).

55a-55b. VOICE, FOURTH YEAR.—*I, II*; (6).

56a-56b. VOICE, ONE YEAR.—The first year's work in voice taken as a minor by senior collegiate students majoring in piano or violin. *I, II*; (2).

57a-57b. VOICE.—For students from other departments of the University. *I, II*; (no credit).

VIOLIN

Mr. MORPHY

Hours to be arranged.

(See note on page 259, under courses in piano.)

61a-61b. PREPARATORY COURSE IN VIOLIN, FIRST YEAR.—*I, II*; (no collegiate credit).

61c-61d. PREPARATORY COURSE IN VIOLIN, SECOND YEAR.—*I, II*; (no collegiate credit).

61e-61f. PREPARATORY COURSE IN VIOLIN, THIRD YEAR.—*I, II*; (no collegiate credit).

62a-62b. VIOLIN, FIRST YEAR.—*I, II*; (6).

63a-63b. VIOLIN, SECOND YEAR.—*I, II*; (6).

64a-64b. VIOLIN, THIRD YEAR.—*I, II*; (6).

65a-65b. VIOLIN, FOURTH YEAR.—*I, II*; (6).

66a-66b. VIOLIN, ONE YEAR.—The first year's work in violin taken as a minor by senior collegiate students majoring in piano or voice. *I, II*; (2).

67a-67b. VIOLIN.—For students from other departments of the University. *I, II*; (no credit).

VIOLONCELLO

Mr. SCHWARTZ

Hours to be arranged.

(See note on page 259, under courses in piano.)

71a-71b. PREPARATORY COURSE IN VIOLONCELLO, FIRST YEAR.—*I, II*; (no collegiate credit).

71c-71d. PREPARATORY COURSE IN VIOLONCELLO, SECOND YEAR.—*I, II*; (no collegiate credit).

71e-71f. PREPARATORY COURSE IN VIOLONCELLO, THIRD YEAR.—*I, II*; (no collegiate credit).

72a-72b. VIOLONCELLO, FIRST YEAR.—*I, II*; (6).

73a-73b. VIOLONCELLO, SECOND YEAR.—*I, II*; (6).

74a-74b. VIOLONCELLO, THIRD YEAR.—*I, II*; (6).

*BAND, ORCHESTRA, AND ENSEMBLE WORK

91a-91b. ORCHESTRA.—I, II; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	91a	1	—	—	—	4	—	—	—	Chapel	Morphy

SECOND SEMESTER

Music	91b	1	—	Schedule the same as for 91a (first semester).							
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92a-92b. BAND INSTRUMENTS.—(No credit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	92a	—	—	—	—	—	—	—	—	(Arrange)	Harding

SECOND SEMESTER

Music	92b	—	—	Schedule the same as for 92a (first semester).							
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93a-93b. CHORAL SOCIETY.—I, II; ($\frac{1}{2}$).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	93a	$\frac{1}{2}$	—	—	—	7 P.M.	—	—	—	Chem. Lec. Room	—

SECOND SEMESTER

Music	93b	$\frac{1}{2}$	—	Schedule the same as for 93a (first semester).							
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94a-94b. RECITAL COURSE IN PRACTICAL MUSIC.—(For seniors in Music 41e-41f, 51e-51f, 61e-61f.)

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	94a	—	—	—	—	—	—	—	—	(Arrange)	—

SECOND SEMESTER

Music	94b	—	—	—	—	—	—	—	—	(Arrange)	—
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PHILOSOPHY

(See also PSYCHOLOGY and EDUCATION.)

ARTHUR HILL DANIELS, Ph.D., *Professor*BOYD HENRY BODE, Ph.D., *Professor*QUEEN LOIS SHEPHERD, Ph.D., *Instructor*CARL HERMAN HAESSLER, A.B., *Assistant*

Students who make philosophy a major should take at least six hours of psychology. The six hours in psychology may be counted towards a major of 20 hours in philosophy. This major must include philosophy 1, 2, 3, 4, and one other advanced course.

With the exception of 1 and 10, no course in philosophy may be taken before the completion of two years of university work.

*For information concerning registration in the University bands, see the Director of the Band, 217 U. H., or Director of the School of Music, 201 University Hall.

Honors

Candidates for honors in philosophy must offer:

1. In the major subject, 24 hours, 6 of which must be in psychology.
2. Minors in either: psychology (at least 6 hours in addition to the amount of psychology required for the major) and any one other subject listed below; or any two subjects from the same group—
 - (a) Economics; history; political science; education; sociology.
 - (b) English; French; German; Greek; Latin.
 - (c) Botany; chemistry; mathematics; physics; zoology.

No course in any subject of the above groups may be counted for the minor requirement if it is excluded from the major requirement of its respective department.

COURSES FOR UNDERGRADUATES

1. LOGIC.—The principles of reasoning; detection of fallacies; evidence. *I*; (3).

Prerequisite: One year of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	1	3	—	1	—	1	—	1	—	410 U. H.	Bode, Shepherd, Haessler

SECOND SEMESTER

2	—	2	—	2	—	410 U. H.	Bode, Shepherd, Haessler
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2. INTRODUCTION TO PHILOSOPHY.—A study of philosophic problems in their relation to the doctrine of evolution and in their bearing on conduct and religion. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	2	3	—	1	—	1	—	1	—	315 U. H.	Bode, Shepherd

9. POLITICAL AND SOCIAL ETHICS.—Moral principles applied to political and social relations. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	9	2	—	—	10	—	10	—	—	308 L. H.	Daniels

- [10. THE PHILOSOPHIC THOUGHT OF THE NINETEENTH CENTURY AS REFLECTED IN ENGLISH LITERATURE.—Wordsworth; Carlyle; Emerson; Tennyson; Browning; Arnold. *I*; (2). Not given, 1914-15.]

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

3. ANCIENT AND MEDIEVAL PHILOSOPHY.—The development of philosophic thought; the Greek philosophers; the medieval period. *I*; (3).

Prerequisite: Three hours in philosophy.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	3	3	—	11	—	11	—	11	—	117 L. H.	Daniels

4. HISTORY OF MODERN PHILOSOPHY.—Problems and conceptions in philosophy from Descartes to the present time. Selections from the masterpieces of this period. *II*; (3).

Prerequisite: Three hours in philosophy.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	4	3	—	11	—	11	—	11	—	117 L. H.	Daniels

7. ETHICS.—The beginnings and growth of morality; leading conceptions of ethical theory; typical social and economic problems of the present. *II*; (3).

Prerequisite: Three hours in philosophy.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	7	3	—	3	—	3	—	3	—	117 L. H.	Daniels

[8. ESTHETICS.—The appreciation of art and nature; place of such appreciation in life; primitive arts and appreciation; modifications of the esthetic (such as the sublime and the ugly); the fine arts. *I*; (3). Not given in 1914-15.

Prerequisite: An elementary course in philosophy or psychology.]

11. PHILOSOPHY OF RELIGION.—The philosophical interpretation of religious consciousness; various religious concepts: God; revelation; inspiration; dogma; faith; prayer; immortality; evil; morality and religion. *II*; (2).

Prerequisite: Senior or graduate standing; six hours in psychology, philosophy, or both.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	11	2	—	—	11	—	11	—	—	117 L. H.	Daniels

15. THE BRITISH PHILOSOPHERS OF THE EIGHTEENTH CENTURY.—Locke, Berkeley, and Hume. *I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	15	3	—					(Arrange)		113 L. H.	Bode

16. AMERICAN PHILOSOPHY.—*II*; (3).

Prerequisite: Philosophy 15.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	16	3	—					(Arrange)		113 L. H.	Bode

17. ADVANCED LOGIC.—*I*; (3).

Prerequisite: Philosophy 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	17	3	—					(Arrange)		113 L. H.	Shepherd

18. LOGICAL THEORY IN ITS BEARING ON PHILOSOPHICAL PROBLEMS.—II; (3).

Prerequisite: Philosophy 17.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	18	3	—					(Arrange)		113 L. H.	Shepherd

19. THE DEVELOPMENT OF RELIGIOUS THOUGHT IN THE EIGHTEENTH AND NINETEENTH CENTURIES.—I; (3).

Prerequisite: Philosophy 2 or 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	19	3	—					(Arrange)		113 L. H.	Shepherd

COURSES FOR GRADUATES

Every student entering upon graduate work in philosophy must have had a thoro general course in the history of philosophy, a course in logic, and a general course in psychology.

102. SEMINAR, CONTEMPORARY PHILOSOPHY.—Present day idealism, realism, and pragmatism. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	102	1 unit	—					(Arrange)		107 L. H.	Bode

[106. SEMINAR, CONTEMPORARY PHILOSOPHY.—The Philosophy of Bergson. *Twice a week; I, II; (1 unit).* Not given in 1914-15.]

103. SEMINAR, ETHICAL THEORY.—*Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	103	1 unit	—					(Arrange)		107 L. H.	Daniels

107a-107b-107c. HISTORY OF PHILOSOPHY.—a: The Philosophy of Plato and Aristotle. *Twice a week; (1 unit).* b: The Philosophy of Descartes, Spinoza, and Leibnitz. *Twice a week; (1 unit).* c: The Philosophy of Kant and Schopenhauer. *Twice a week; (1 unit).* I, II. (The subjects in 1914-15 will be determined by the needs of the students registered.)

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	107a 107b 107c	1 unit						(Arrange)		107 L. H.	Daniels

PHYSICAL TRAINING

FOR MEN

GEORGE A HUFF, *Director*

HARRY LOVERING GILL, *Instructor, Track*

ROY NEWTON FARGO, B.S., *Instructor and Director of the Men's Gymnasium*

EDWARD JOHN MANLEY, *Instructor, Swimming*

RALPH JONES, *Assistant*

1-2. GYMNASIUM PRACTISE.—Two hours' gymnasium drill each week. (Required of freshmen.) *I, II; (1).*

1a. PERSONAL HYGIENE.—Six lectures by the Dean of Men. Required in conjunction with Physical Training I. I.

FIRST SEMESTER

[illegible]

SECOND SEMESTER

P. T.	2	1	—	Sections and schedule the same as for 1 (first semester).
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FOR WOMEN

GERTRUDE EVELYN MOULTON, A.B., *Director*

VERNA BROOKS, A.B., *Instructor*

ANNA LUE HUGHITT, *Assistant*

DOROTHY RUTH SHOEMAKER, A.B., *Assistant*

EDITH GRIFFITH OSMOND, *Assistant*

ROSA-LEE GAUT, Mus.B., *Assistant*

7a-7b. PRACTISE.—Class work; individual experimentation in personal hygiene; individual corrective work; games. Required of freshmen. *I, II; (I).*

FIRST SEMESTER

<i>Subject</i> P. T.	<i>No.</i> 7a	<i>Credits</i> 1	<i>Section</i> A	<i>M</i> 9	<i>T</i> —	<i>W</i> 9	<i>T</i> —	<i>F</i> 9	<i>S</i> —	<i>Room</i> W. H.	<i>Instructor</i> Moulton Hughitt Brooks Shoemaker Osmond
			B	—	10	—	10	10	—	W. H.	
			C	11	—	11	—	11	—	W. H.	
			D	11	—	11	—	11	—	W. H.	
			E	2	—	2	—	2	—	W. H.	
			F	2	—	2	—	2	—	W. H.	
			G	3	—	3	3	—	—	W. H.	
			H	—	3	—	3	3	—	W. H.	

SECOND SEMESTER

P. T.	7b	1	—	Sections and schedule the same as for 7a (first semester).
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8a-8b. PRACTISE.—(Continuation of 7a-7b. Second year, elective). *I, II;* (1).

Prerequisite: P. T. 7a and 7b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	8a	1	A	10	—	10	—	10	—	W. H.	—
			B	3	—	3	—	3	—	W. H.	Brooks, Hughitt
			C	4	4	4	—	—	—	W. H.	Shoemaker, Osmond

SECOND SEMESTER

P. T.	8b	1	—	Sections and schedule the same as for 8a (first semester).							
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9. HYGIENE.—Required of freshmen. *I;* (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	9	1	—	4	—	—	—	—	—	—	Kyle

10a-10b. TEACHERS' COURSE.—Third year. Kinesiology, history of education and theory of practise and practise of teaching. Theory, one hour; practise in the gymnasium and in the public playgrounds. *I, II.*

Prerequisite: P. T. 7a and 7b; P. T. 9; Psychology 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	10a	—	—	—	—	—	—	—	10-12	W. H.	Moulton, Brooks

SECOND SEMESTER

P. T.	10b	—	—	Sections and schedule the same as for 10a (first semester).							
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11a-11b. TEACHERS' COURSE.—Fourth year. A. Anthropometry, massage, corrective gymnastics. B. First aid. *I, II.*

Prerequisite: P. T. 10a and 10b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	11a	—	—	(Arrange)						W. H.	Hughitt

SECOND SEMESTER

P. T.	11b	—	—	(Arrange)						W. H.	Hughitt
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PHYSICS

ALBERT PRUDEN CARMAN, D.Sc., *Professor*

CHARLES TOBIAS KNIPP, Ph.D., *Assistant Professor*

FLOYD ROWE WATSON, Ph.D., *Assistant Professor*

WILLIAM FREDERICK SCHULZ, E.E., Ph.D., *Assistant Professor*

JAKOB KUNZ, Ph.D., *Assistant Professor, Mathematical Physics*

ELMER HOWARD WILLIAMS, Ph.D., *Associate*

LLOYD THEODORE JONES, A.M., *Instructor*

WILLIAM HENRY HYSLOP, A.M., *Assistant*
 OSCAR ALAN RANDOLPH, M.S., *Assistant*
 EARLE HORACE WARNER, A.M., *Assistant*
 SEBASTIAN KARRER, A.M., *Assistant*
 JONAS BERNARD NATHANSON, A.M., *Assistant*
 PAUL LEVERN BAYLEY, A.M., *Assistant*
 CHARLES FRANCIS HILL, A.B., *Assistant*

INTRODUCTORY COURSES FOR UNDERGRADUATES

1a-1b. GENERAL PHYSICS.—Lectures with class-room demonstrations; recitations; written exercises. (For sophomores in engineering, mathematics, physics, and chemistry.) *I*; (3); *II*; (2).

Prerequisite: Registration in Physics 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	1a	3	Lecture								
			I	9	—	9	—	—	—	100 P. L.	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> Carman Schulz Jones Hyslop Warner Hill Nathanson </div> <div style="font-size: 4em; margin-right: 10px;">}</div> </div>
			II	11	—	11	—	—	—	100 P. L.	
			Quiz								
			C	—	—	—	—	11	—		
			D	—	—	—	—	11	—		
			E	—	—	—	—	11	—		
			F	—	—	—	—	9	—	104 P. L.	
			G	—	—	—	—	9	—	108 P. L.	
			K	—	—	—	—	11	—	302 P. L.	
			L	—	—	—	—	11	—	305 P. L.	
			M	—	—	—	—	9	—	306 P. L.	
			N	—	—	—	—	9	—	403 P. L.	
			O	—	—	—	—	9	—	406 P. L.	
			P	—	—	—	—	11	—		
			Q	—	—	—	—	11	—		

SECOND SEMESTER

Physics 1b 2 — Sections and schedule the same as for 1a (first semester).

3a-3b. PHYSICAL MEASUREMENTS.—Laboratory experiments; quizzes in connection with Physics 1a-1b. (3a), *I*; (3b), *II*; (2).

Prerequisite: Registration in Physics 1a-1b or credit for the same.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	3a	2	C	8-10	—	8-10	—	—	—		<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> Schulz Jones Hyslop Warner Nathanson Hill </div> <div style="font-size: 4em; margin-right: 10px;">}</div> </div>
			D	8-10	—	8-10	—	—	—		
			E	—	—	2-4	—	—	10-12		
			F	—	—	2-4	—	—	10-12		
			G	—	10-12	—	10-12	—	—	305 P. L.	
			K	2-4	—	—	—	2-4	—	312 P. L.	
			L	—	2-4	—	2-4	—	—	403 P. L.	
			M	10-12	—	10-12	—	—	—	406 P. L.	
			N	—	8-10	—	8-10	—	—		
			O	—	2-4	—	2-4	—	—		
			P	—	2-4	—	2-4	—	—		
			Q	8-10	—	8-10	—	—	—		

SECOND SEMESTER

Physics 3b 2 — Sections and schedule the same as for 3a (first semester).

ADVANCED COURSES FOR GRADUATES AND UNDERGRADUATES

4a-4b. ELECTRICAL AND MAGNETIC MEASUREMENTS.—A course of exact electrical and magnetic measurements with accompanying theory. The course for the first semester includes the more refined and special methods of measuring resistances, including very low and very high resistances; a study of galvanometers both aperiodic and ballistic; the measurement of electric currents and quantity; the comparison of capacities. In the second semester is given the absolute determination of capacity; the determination of the damping factor of a ballistic galvanometer; a discussion of circuits containing resistance and self-induction followed by several of the classical methods for the measurement of self and mutual induction; the magnetic properties of iron are studied by several methods, curves are plotted and hysteresis losses determined. Work with various types of potentiometers is also included. For the first semester, there is a special section for students of chemistry. For these students a course of experiments has been arranged which includes the measurement of electrolytic resistances, the use of the Dolezalek electrometer, the use of thermo-couples and of platinum resistance thermometers for measuring temperatures; the determination of the dielectric constants of solids and liquids; and special uses of the potentiometer. *I, II; (2).*

Prerequisite: Physics 1a-1b, 3a-3b, or 7a-7b, 8a-8b and Mathematics 7, 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	4a	2	K	—	—	1-4	—	1-4	—	112 P. L.	} Knipp Randolph Bayley
			L	1-4	—	—	—	—	8-11	112 P. L.	
			M	—	1-4	—	1-4	—	—	112 P. L.	
			N	—	1-4	—	1-4	—	—	112 P. L.	

SECOND SEMESTER

Physics	4b	2	—	Sections and schedule the same as for 4a (first semester).							
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Note: Special section for chemical students (arrange time).

7a-7b. GENERAL PHYSICS.—Lectures, with class-room demonstrations; recitations. (For students in arts and science.) *I, II; (½).*

Prerequisite: Completion of or registration in trigonometry (Mathematics 4); registration in Physics 9a-9b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	7a	2½	Lecture	—	11	—	11	—	—	119 P. L.	} Watson Williams Karrar
			A, Quiz	—	—	—	—	9	—	208 P. L.	
			B, Quiz	—	—	—	—	10	—	208 P. L.	

SECOND SEMESTER

Physics	7b	2½	—	Sections and schedule the same as for 7a (first semester).							
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8a-8b. INTRODUCTORY LABORATORY PHYSICS.—Physical measurements. *I, II; (2½).*

Prerequisite: Registration in Physics 7a-7b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	8a	2½	A	10-12	—	10-12	—	—	—	212 P. L.	Williams
			A, Quiz	2-4	—	2-4	—	—	—	212 P. L.	Karrar

SECOND SEMESTER

Physics 8b 2½ — Sections and schedule the same as for 8a (first semester).

9a-9b. GENERAL PHYSICS.—Lectures, with class-room demonstrations; recitations. (For students in architecture.) *I, II; (2).*

Prerequisite: Trigonometry (Mathematics 4); registration in Physics 10a-10b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	9a	2	Lecture	—	11	—	11	—	—	119 P. L.	} Watson Williams Karrar
			A, Quiz	—	—	—	—	9	—	119 P. L.	
			B, Quiz	—	—	—	—	11	—	208 P. L.	

SECOND SEMESTER

Physics 9b 2 — Sections and schedule the same as for 9a (first semester).

10a-10b. INTRODUCTORY LABORATORY PHYSICS.—Physical measurements. *I, II; (2½).*

Prerequisite: Registration in Physics 9a-9b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	10a	2½	A	8-10	—	8-10	—	—	—	212 P. L.	Williams Karrar
			B	—	8-10	—	8-10	—	—	119,305 P. L.	

SECOND SEMESTER

Physics 10b 2½ — Sections and schedule the same as for 10a (first semester).

15. ELECTRICITY AND MAGNETISM.—Two recitations or lectures weekly, using Brooks and Poyser's *Electricity and Magnetism*; one laboratory exercise weekly. *I; (3).*

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	15	3	—	—	9	—	9	—	8-11	104 P. L.	Knipp
										112 P. L.	Knipp

[14. MECHANICS AND ADVANCED GENERAL PHYSICS.—Theoretical physics involving the calculus. Dynamics, with a brief introduction to thermodynamics. *I; (3).* Not given in 1914-15.]

Prerequisite: A course in general physics, such as Physics 7a-7b and 8a-8b, or 1a-1b and 3a-3b, and a course in calculus.]

16. HEAT.—Discussions and recitations on fundamental heat phenomena, the elements of the mechanical theory of heat and elementary thermodynamics. Laboratory experiments in thermometry, calorimetry, vapor pressure, expansion of bodies, transmission of heat, mechanical equivalent, etc. *I; (3).*

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	16	3	—	—	9	—	9	—	9-12	306 P. L.	Watson
										213 P. L.	Watson

17. **LIGHT.**—A course of lectures and recitations on reflection, refraction, interference, diffraction and polarization, followed by laboratory experiments on these phenomena, and the theory and use of optical instruments, such as telescopes, microscopes, refractometers, prism and grating spectroscopes, interferometers, etc. Edser's "*Light for Students.*" *I*; (2).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	17	2	—	—	3	—	3-5	—	—	306 P. L. 313 P. L.	Schulz Schulz

18. **TEACHERS' COURSE.**—Discussion of text-books, reference books, laboratory manuals, apparatus ordering, and methods of conducting work in physics. Manipulative work with glass and apparatus. Discussion of selected topics in advanced general physics. *II*; (2).

Prerequisite: A course in general physics, or experience in teaching.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	18	2	—	2	—	—	—	2	—	208 P. L.	Watson

20. **LIGHT.**—Special phenomena; modern theories; readings in texts of Drude, Wood, and Preston. Lectures; recitations. *I* or *II*; (2).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b; Mathematics 7, 9, or 8.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	20	2	—	4	—	—	—	4	—	403 P. L.	Schulz

22. **LIGHT-PHOTOMETRY.**—Lectures, recitations and laboratory experiments on the scientific principles and methods of photometry; the comparison of various light sources with standards; the determination of reflective power and transmission coefficients; spectrophotometry, etc. *II*; *(2 to 5).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	22	*2 to 5	—	—	3	—	3-5	—	—	306 P. L. 401 P. L.	Schulz Schulz

23. **SOUND.**—Lectures and recitations on phenomena of sound. The course includes a consideration of the origin, propagation, velocity, and interference of sound, the vibration of strings, rods, and gas columns, and the physical theory of music and speech. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b. Calculus advised.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	23	3	—	—	9	—	9	—	9	306 P. L.	Watson

25. **HEAT.**—Advanced laboratory work in heat involving mostly the theory and methods of measurement of temperatures by thermocouples, resistance thermometers and optical pyrometers. *II*; (2).

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b. Physics 16 advised.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	25	2	—	—	2-4	—	2-4	—	—	213 P. L.	Watson

29. ELECTRICAL CURRENTS AND OSCILLATIONS.—A course of lectures, recitations, and laboratory measurements for advanced students in physics. The generation of currents, continuous and alternating of both low and high frequencies. The physical problems of the currents and the generators are discussed. Two recitations and one laboratory exercise weekly. *I*; (3).

Prerequisite: Physics 4a-4b, Mathematics 7, 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	29	3	—	—	8	—	8	1-4	—	306 P. L. 115 P. L.	Carman Williams

30. INTRODUCTION TO THEORETICAL ELECTRICITY.—Electrical phenomena discussed with calculus methods. Lectures; recitations; occasional demonstrations. Foster and Porter's *Electricity and Magnetism*; *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	30	3	—	—	9	—	9	—	9	102 P. L.	Knipp

31a-31b. SPECIAL PROBLEMS IN ADVANCED PHYSICAL MEASUREMENTS.—*I*, *II*; *(2 or 3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	31a	*2 or 3	—							(Arrange)	Carman, Knipp, Watson, Schulz, Williams

SECOND SEMESTER

Physics	31b	*2 or 3	—							(Arrange)
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32. ELECTRICITY AND MAGNETISM.—Electrical measurements; special methods of measuring self and mutual inductance, capacity, etc.; measurement of low resistances; standardization and calibration work. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	32	2	—	—	1-4	—	1-4	—	—	103 P. L.	Williams

COURSES FOR GRADUATES

The prerequisite for graduate work in physics is a college course in general physics with a year's laboratory course in introductory physical measurements. The student who is to do major work in physics should also have had additional courses in physics or teaching experience, unless the training in his minor subjects, mathematics or chemistry, has been strong and complete. He should also

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

have a knowledge of French and German sufficient to use references in these languages. The courses named below are those open for candidates for the Master's or Doctor's degree. A large part of the last year's work of the candidate for the Doctor's degree is investigational, along either the experimental or the theoretical side of physics. In addition to these major graduate courses, the courses in elementary dynamics, heat, light, electrical measurements, and introductory electrical theory, are arranged with certain additions for graduate credit. The "intermediate" courses on heat, light, and electricity and magnetism may be offered by students making a minor in physics.

121. RECENT ADVANCES IN PHYSICS AND THE ELECTRON THEORY.—A series of lectures of a non-mathematical character, describing and discussing some of the more recent discoveries in physics, and showing by a considerable number of experiments some of the leading phenomena. The presentations and discussions will be of interest to the general student who wishes to obtain an insight into the present work and problems of physics. The main topics to be presented are:—the molecular and atomic structure of matter; the universal occurrence of electrons; determination of the elementary charge of the electron by means of the fog method, by Brownian movements, by radioactivity; the cathode rays, canal rays, and Roentgen rays; ionization of gases through Roentgen rays; α , β , and γ rays; a short review of radioactivity; conduction of heat and electricity through metals, Zeeman phenomenon; the origin of light; emission and absorption spectra; chemical actions of the different rays; photoelectricity; and the structure of the atom. *Three hours a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	121	$\frac{1}{2}$ unit	—	—	5-6	—	4-6	—	—	305 T. B.	Knipp Kunz

[123. SOUND.—Lectures and recitations. Rayleigh's *Sound*, Auerbach's *Akustik* and Barton's *Sound* are used as reference texts. *Twice a week; I, II; (1 unit).* Not given in 1914-15.]

124. CONDUCTION OF ELECTRICITY THROUGH GASES.—Laboratory problems with readings and discussions on the electrical conductivity of gases, ions and ionisation, the effect of a magnetic field, the motion of ions, spark discharge, cathode rays. Roentgen rays, canal or positive rays, and related phenomena of radioactivity. *Three times a week; I, II; (1 to 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	124	1 to 2 units	—							(Arrange)	Knipp

126. PHYSICS COLLOQUIUM.—Weekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems in physics. Many of these papers are on investigations in progress in the laboratory and experimental demonstrations are used. Attendance on this colloquium is expected of all the graduate students tho it is not registered except in the cases of those making special reports on original investigations. *Once a week; I, II; ($\frac{1}{4}$ to $\frac{1}{2}$ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	126	$\frac{1}{4}$ to $\frac{1}{2}$ unit	—	—	—	—	6:45-8:00 P.M.	—	—	—	—

127. ELECTRON THEORY.—*Mathematical part.* (A knowledge of differential equations and of light, electricity and magnetism is presupposed.) Topics to be considered: Maxwell's equations applied to electrons in motion, theory of relativity and electromagnetic emission theory of light. Optical properties of metals, conduction of heat and electricity through metals; Hall effect and related phenomena; the origin and nature of Roentgen rays; reflection and interference of Roentgen rays; theory of the dielectric constant and of dispersion of light; Zeeman phenomenon; the structure of the atom; and the theory of magnetism. *Twice a week; I and II; ($\frac{1}{2}$ to 1 unit).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	127 $\frac{1}{2}$ to 1 unit	—					(Arrange)		302 P. L.	Kunz

131. INVESTIGATION OF SPECIAL PROBLEMS.—Advanced laboratory or design and calculation. A problem worked out with the advice and direction of the instructor. *Two to four times a week; I, II; (1 to 2 units).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	131 1 to 2 units	—							(Arrange)	Carman Knipp Watson Kunz Schulz Williams

[132. MATHEMATICAL PHYSICS.—Special phases in theoretical physics.

(a) DYNAMICS.—*First part:* dynamics of a material system, determination of the center of gravity, moment of inertia and potential, potential theory, with applications in celestial mechanics. *Second part:* the principle of least action. Lagrange's equations, the theory of the top and its applications. The fundamental equations of elasticity, hydrodynamics, of the electromagnetic field and the second principle of thermodynamics for reversible processes deduced from the principle of least action. *Three times a week; I, II; (1 to $1\frac{1}{2}$ units).*

(b) ELECTRODYNAMICS.—Lectures; collateral reading. Problems from Jean's *Mathematical Theory of Electricity and Magnetism*; the potential theory: spherical harmonics, conjugate functions, and some theorems of the vector analysis; capacities, coefficients of self, and mutual induction; theory of absolute electrical measurements and the condenser discharge with its application in wireless telegraphy; Maxwell's theory with some applications in optics, such as the optical properties of metals; modern modifications of Maxwell's theory: the theory of relativity and the electromagnetic emission theory of light. (Continued in the following year in course 132d. Not given, 1914-15.)]

132c. THERMODYNAMICS AND KINETIC THEORY OF MATTER.—The two fundamental principles developed and applied to various physical and chemical phenomena, such as elasticity, surface tension, vapor pressure, osmotic pressure, electromotive forces of galvanic cells, etc.; the theory of chemical equilibrium; the Nernst theorem with its applications; the direct method of Carnot's cycle together with the method of the thermodynamic potentials and the derived functions; the kinetic theory of gases; the elementary theorems briefly

repeated; the phenomena of transfer of mass, momentum and energy; Maxwell's theory of the distribution of velocities in a gas; Boltzman's H theory and the connection between entropy and probability and statistical mechanics; the theory of radiation, especially Planck's theory of quanta, and the recent applications in the specific heat and photoelectricity. Current literature. *I and II; (1 to 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	132c	1 to 2	units —	10	—	10	—	10	—	306 P. L.	Kunz

[132d. THEORY OF ELECTRICAL OSCILLATIONS AND CYLINDRICAL HARMONICS. —The conduction of heat and electricity through cylinders and cables leads to the introduction of cylindrical harmonies of real arguments. Their mathematical properties will be studied. Electrical oscillations along parallel wires, the vibrations from a Wertz oscillator and from antenna, the resonance phenomena between sending and receiving stations, the propagation of electrical waves over the surface of the earth and their absorption will be studied in the first part of the course. Cylindrical and spherical harmonies will then be used for the solution of special problems, such as the resistance and self induction of wires. Applications of cylindrical harmonies will finally be made for phenomena in optics and radiation of light and heat. *Four times a week; I, II; (1 to 2 units).* Not given in 1914-15.]

133. SEMINAR.—*Three or five times a week; I, II; (1 to 3 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	133	1 to 3	units —								
								(Arrange)			
											Carman
											Knipp
											Watson
											Schulz
											Kunz

PHYSIOLOGY

WILLIAM EDWARD BURGE, Ph.D., *Assistant Professor*

JOSEPH HOWARD BEARD, A.M., M.D., *Instructor*

ALMA JESSIE NEILL, A.B., *Assistant*

Of the courses outlined below, 1, 2, and 6 are designed primarily for medical students, or for those intending to specialize in physiology; courses 4 and 6 may be taken by students desiring courses in general physiology; courses 3 and 5 are open to seniors in the medical course and 103 to graduate students.

The laboratory is equipped for the pursuance of investigation in physiology.

I. HISTOLOGY.—Fundamental mammalian tissues; microscopic anatomy of the organs. Lectures and laboratory. *I; (5).*

Prerequisite: Two years of university work including five hours in botany or zoology.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	1	5	Lecture	—	10	—	10	—	—	415 N. H.	Burge
			Laboratory	10,11	—	10,11	—	10,11	—	415 N. H.	Beard

2. EXPERIMENTAL PHYSIOLOGY.—Physiology of nerve and muscle; circulation; respiration; secretion; digestion; metabolism. Lectures and laboratory. *II*; (7).

Prerequisite: Physiology 1; Chemistry 15; Physics 7a-7b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	2	7	Lecture	8	—	—	—	8	—	413 N. H.	Burge
			Laboratory	9-12	—	9-12	—	9-12	—	413 N. H.	Burge, Beard

3. UNDERGRADUATE THESIS.—(For undergraduates who wish a thesis course.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	3	—	—					(Arrange)		414 N. H.	Burge

4a-4b. GENERAL PHYSIOLOGY, CHEMICAL AND EXPERIMENTAL.—Lectures, demonstrations, recitations, and laboratory work. *I, II*; (5).

Prerequisite: One semester of university work including five hours in botany or zoology and five hours in chemistry.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	4a	5	Lecture	—	9	—	—	—	9	228 N. H.	Burge
			A, Laboratory	—	—	8,9	8,9	8,9	—	413 N. H.	Burge, Beard, Neill
			B, Laboratory	—	—	1,2	1,2	1,2	—	413 N. H.	Burge, Beard, Neill

SECOND SEMESTER

Physiology	4b	5	Lecture	—	9	—	—	—	9	228 N. H.	Burge
			Laboratory	—	—	1,2	1,2	1,2	—	413 N. H.	Burge, Beard, Neill

5a-5b. SPECIAL PHYSIOLOGY.—(For advanced students who wish to take up a special line of work not specified in one of the other courses.) Laboratory; conferences. *I, II*; *(3 hours or more).

Prerequisite: The consent of the head of the department.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	5a	*3 or more	—					(Arrange)		414 N. H.	Burge

SECOND SEMESTER

Physiology	5b	*3 or more	—					(Arrange)		414 N. H.	Burge
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6. PHYSIOLOGY OF THE NERVOUS SYSTEM AND THE SENSES.—Lectures and laboratory. *II*; (3).

Prerequisite: Physiology 4a-4b or registration in Physiology 2.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	6	3	Lecture	—	—	—	9	—	—	413 N. H.	Burge
			Laboratory	—	9,10,11	—	10,11	—	—	413 N. H.	Burge, Beard

COURSE FOR GRADUATES

103. RESEARCH.—*Once a week; I, II; (1 to 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	103	1 to 2 units	—							414 N. H.	Burge

POLITICAL SCIENCE

(See also ECONOMICS, HISTORY, and SOCIOLOGY)

JAMES WILFORD GARNER, Ph.D., *Professor*

*JOHN ARCHIBALD FAIRLIE, Ph.D., *Professor*

†WALTER FAIRLEIGH DODD, Ph.D., *Assistant Professor*

JOHN MABRY MATHEWS, Ph.D., *Associate*

RUSSELL McCULLOCH STORY, A.M., *Instructor*

ALFRED CHESTER HANFORD, A.M., *Assistant*

Honors

1. A total of 24 hours required for honors in political science may, with the consent of the department, include courses in constitutional history (History 4 and 14), political philosophy (Philosophy 5), or law (not exceeding six hours).

2. One minor must be history, in which courses must be offered aggregating not less than 12 hours. The other minor may be economics, sociology or philosophy, aggregating not less than 9 hours.

3. A reading knowledge of one modern language is advised.

COURSES FOR UNDERGRADUATES

Courses 1 and 3 are intended to furnish a general survey of the field of national, state, and local government in the United States, and should be taken by all students who expect to specialize in political science. Course 1A is for the benefit of students in the Colleges of Engineering and Agriculture who may desire an introductory course in American Government, and is open only to such students.

1. AMERICAN GOVERNMENT.—Historical development, organization, powers, limitations, and practical working of the national government in the United States. *I; (3).*

*On leave first semester.

†On leave second semester.

Prerequisite: Thirty hours of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	1	3	I, Lecture	10	—	10	—	—	—	218 U. H.	Mathews
			A, Quiz	—	—	—	—	9	—	312 Com.	Mathews
			B, Quiz	—	—	—	—	10	—	312 Com.	Mathews
			C, Quiz	—	—	—	—	10	—	206 Com.	Hanford
			D, Quiz	—	—	—	—	10	—	111 Com.	Story
			II, Lecture and quiz	2	—	2	—	2	—	204 Com.	Garner

3. STATE AND LOCAL GOVERNMENT.—Powers, obligations, and rights of the states in the Federal Union; formation and admission of states; development of state constitutions; organization of state and local government; political methods. (A continuation of course I; may be taken independently.) II; (3).

Prerequisite: Thirty hours of university work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	3	3	I, Lecture	10	—	10	—	—	—	228 U. H.	Mathews
			A, Quiz	—	—	—	—	—	9	204 Com.	Mathews
			B, Quiz	—	—	—	—	—	10	308 Com.	Mathews
			C, Quiz	—	—	—	—	—	10	101 Com.	Hanford
			II, Lecture and quiz	10	—	10	—	10	—	111 Com.	Story
			III, Lecture and quiz	2	—	2	—	2	—	204 Com.	Garner

1A. AMERICAN GOVERNMENT AND POLITICS.—A general survey of American government, national, state and local. (Open only to students in the colleges of Engineering and Agriculture.) II; (2).

Prerequisite: Thirty hours of university work. No credit is allowed for this course if the student has already had or subsequently takes course I or 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	1A	2	—	—	11	—	11	—	—	—	Story

16. GOVERNMENT OF ILLINOIS.—Constitutional development, organization and administration of state and local government in Illinois; the legislature; the executive; the judiciary; state officers and institutions; county, town and municipal government. II; (2).

Prerequisite: Thirty hours of university work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	16	2	—	—	10	—	10	—	—	317 L. H.	Story

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES.

(At least junior standing required)

4. MUNICIPAL GOVERNMENT.—The growth of cities; municipal organization in the United States; the mayor and the council; commission government; the city manager plan; a preliminary consideration of municipal functions and the problems of city government. Lectures; assigned readings; reports. I; (3).

Prerequisite: One course in political science or Economics I.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	4	3	—	8	—	8	—	8	—	317 L. H.	Story

5. CONSTITUTIONAL LAW OF THE UNITED STATES.—The judicial interpretation of the Constitution of the United States; judicial power to declare laws unconstitutional; separation of governmental powers; relation between state and national government; fundamental rights under the constitution (due process of law, contract); territories and dependencies; national powers with respect to taxation, commerce; jurisdiction of the United States courts. *I*; (4).

Prerequisite: Political Science I.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	5	4	—	9	—	9	9	9	—	317 L. H.	Dodd

6. INTERNATIONAL LAW.—The development of the law of nations; its nature, source, and present status; the doctrine of intervention; the laws of war and peace; the rights and duties of neutrals; the arbitration movement. Lectures, assigned readings and reports. *I*; (3).

Prerequisite: Graduate or senior standing, or junior standing with six hours of history and five hours of political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	6	3	—	3	—	3	—	3	—	317 L. H.	Garner

7. AMERICAN DIPLOMACY.—A study of the genesis and present organization of the Department of State; the diplomatic service; the treaty making power; the methods and traditional principles of the foreign policy of the United States; the principal diplomatic controversies between the United States and foreign powers; the rise of the United States to the position of a world power. *II*; (3).

Prerequisite: Junior standing and Political Science I or History 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	7	3	—	2	—	2	—	2	—	317 L. H.	Mathews

9. PRINCIPLES OF JURISPRUDENCE.—The nature of law; historical development of the English legal system; English common law in the United States; courses of law and relation between statutes and judicial decisions; brief discussion of the various branches of law (crime, tort, contract, etc.) and their relation to one another. *I*; (3).

Prerequisite: Political Science I or its equivalent and junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science	9	3	—	10	—	10	—	10	—	317 L. H.	Dodd

13. STATE ADMINISTRATION IN THE UNITED STATES.—The administrative position of the governor and the organization of the state administrative departments; state administrative disintegration and the influence of the diffusion

of the executive power upon the enforcement of state law; organization and powers of state boards, commissions, and quasi-judicial tribunals; tendencies toward centralization in the administration of taxation, education, and other state functions; methods of control over state administrative officers. *I*; (3).

Prerequisite: Political Science 3 or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 13	3	—	—	11	—	11	—	11	—	317 L. H.	Mathews

14. POLITICAL PARTIES AND METHODS.—Development of political parties; party organization and methods in the United States and Great Britain; recent legislation on primary elections and corrupt practises. *II*; (2).

Prerequisite: One course in political science.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 14	2	—	—	—	9	—	9	—	—	317 L. H.	Fairlie

21. BRITISH GOVERNMENT.—Political institutions in the United Kingdom and the British possessions: the Crown; the Cabinet; the House of Commons; the House of Lords; the party system; the courts of law; local government; government in the Crown Colonies and the self governing colonies; recent developments and proposed changes. *I*; (3).

Prerequisite: Open only to graduate students and to seniors who have had six hours in political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 21	3	—	—	2	—	2	—	2	—	317 L. H.	Story

22. CONTINENTAL EUROPEAN GOVERNMENTS.—The national political systems of France, Germany, Austria-Hungary, Italy, and Switzerland; constitutional beginnings; political organizations; methods of legislation and administration; constitutional guaranties for the protection of individual rights. *II*; (3).

Prerequisite: Open to graduate students and seniors who have had six hours in political science. History 20a-20b recommended.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 22	3	—	—	3	—	3	—	3	—	317 L. H.	Garner

28. PROBLEMS OF CONTEMPORARY POLITICS.—A study of some of the larger questions of present day politics, domestic and foreign, such as the initiative, the referendum, and the recall; proportional representation; state socialism; the immigration problem; electoral reform; ballot reform; judicial reform; parliamentary government; the Monroe Doctrine; international arbitration, etc. Reports by individual members of the class and general discussion. *II*; (2).

Prerequisite: Senior standing and one course in political science.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 28	2	—	—	—	3	—	3	—	—	317 L. H.	Garner

34. MUNICIPAL PROBLEMS.—Selected topics in municipal administration in the United States and Europe: municipal ownership and regulation of public utilities; police and sanitary administration; city planning and housing; municipal finances. Lectures, readings, and special reports. *II*; (3).

Prerequisite: Open to graduate students and to undergraduates who have had Political Science 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 34	3	—	—	8	—	8	—	8	—	317 L. H.	Fairlie

COURSES FOR GRADUATES

[101. HISTORY OF POLITICAL THEORIES.—Development and history of ancient, medieval and modern political thought; political theories of Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Montesquieu, and others; evolution of American political ideas. Given every other year, alternating with course 102. Not given in 1914-15. *Twice a week; I; (1 unit).*]

102. THE NATURE OF THE STATE.—The principles, methods, and relations of political science; the origin, nature, forms, and functions of the state; sovereignty and liberty; citizenship and nationality; constitutions; principles and methods of political organization. Given in 1914-15 and alternate years, alternating with course 101.) *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 102	1 unit	—	—	—	3	—	3	—	—	301 L. H.	Garner

103. SEMINAR IN POLITICAL SCIENCE AND PUBLIC LAW.—Special problems; reports; discussions and criticism. The research work of candidates who are writing theses is under the direction of some instructor to whom they report frequently. *I, II.*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 103	—	—	—	—	—	—	—	—	—	301 L. H.	Members of the department

[105. SPECIAL TOPICS IN CONSTITUTIONAL LAW.—*Twice a week; II; (1 unit).* Not given in 1914-15.]

112. SPECIAL TOPICS IN COMPARATIVE ADMINISTRATION.—Subject for 1914-15: County and Town Government. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 112	1 unit	—	—	—	—	—	—	—	—	301 L. H.	Fairlie

PSYCHOLOGY

MADISON BENTLEY, Ph.D., *Professor*

CHRISTIAN ALBAN RUCKMICH, Ph.D., *Associate*

JOSEPH EDGAR DeCAMP, Ph.D., *Instructor*

_____, *Instructor*

ANNA SOPHIE ROGERS, A.M., *Assistant*

Major and Minors.—The major, which consists of 20 hours selected under the advice of the department, may be made up from among any of the courses which follow, excepting 103 and 105. The minor may be made up, with the consent of this department, from one or more of the following subjects: physiology, education, zoology, neurology, philosophy, genetics, sociology, and physics. At least 8 hours must be offered in one minor subject chosen.

I. INTRODUCTION TO PSYCHOLOGY.—A brief account of the facts and laws of consciousness. This course seeks to lay the foundation of the science of psychology: it is preliminary to all the other work of the department. Lectures; sectional meetings. *I*; (3).

Prerequisite: One year of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	1	3	Lectures	9	—	9	—	—	—	410 U. H.	Bentley
			A	—	—	—	—	9	—	417 U. H.	Bentley Ruckmich DeCamp —
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	312 U. H.	
			D	—	—	—	—	9	—	410 U. H.	
			E	—	—	—	—	10	—	417 U. H.	
			F	—	—	—	—	11	—	417 U. H.	

2. GENERAL PSYCHOLOGY.—Mental inheritance, habit, custom, and fashion; the relations of psychology to the biological and social sciences; comparative and genetic psychology, and the psychology of the abnormal; applications of psychology to the arts and professions. *II*; (3).

Prerequisite: Psychology I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	2	3	Lectures	9	—	9	—	—	—	410 U. H.	Bentley
			A	—	—	—	—	9	—	417 U. H.	Ruckmich — —
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	410 U. H.	
			D	—	—	—	—	10	—	417 U. H.	

3. LABORATORY PRACTISE (ELEMENTARY).—Classical experiments in the fields of sensation, feeling, attention, and action. A drill course in scientific method. *I or II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	3	2	A	2-4	—	2-4	—	—	—	507 U. H.	Ruckmich

SECOND SEMESTER

A	2-4	—	2-4	—	—	—	507 U. H.	Ruckmich
B	— 10-12	—	10-12	—	—	—	507 U. H.	Bentley

4. LABORATORY PRACTISE (INTERMEDIATE).—Experiments in memory, association, learning, and thought. A part of the term may be devoted either to the metrical methods of psychophysics or to the solution of a small qualitative problem. *I or II*; (2).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	4	2	C	2-4	—	2-4	—	—	—	507 U. H.	Ruckmich

5. COMPARATIVE PSYCHOLOGY.—Mind in the various animal forms; the psychological implications of organic evolution; a comparison of human and animal minds; criticism of current literature. (Recommended to students who intend to elect advanced courses either in animal psychology or in the study of behavior.) Lectures and laboratory exercises. *I*; (2).

Prerequisite: Psychology 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	5	2	—	—	2-4	—	2-4	—	—	507 U. H.	Bentley

6. COMPARATIVE PSYCHOLOGY (ADVANCED LABORATORY).—Individual studies in animal psychology. *II*; *(2-4).

Prerequisite: Psychology 1 and 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	6	*2 to 4	—							(Arrange)	Bentley

[7. THE IMAGE AND IMAGINATION.—Methods of studying the image and the imaginative functions; types of imagery. Lectures, reading, and demonstrations. *I*; (2). Not given in 1914-1915.

Prerequisite: Psychology 1 and 2.]

[8. MEMORY AND ASSOCIATION.—Recollection, recognition, reproduction; forms of the associative consciousness; experimental methods. Lectures, demonstrations, and exercises. *II*; (2). Not given in 1914-1915.

Prerequisite: Psychology 1 and 2.]

10. GERMAN READING.—Translation into English of a German psychological text. *I*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	10	1	—	—	2	—	—	—	—	105 L. H.	Bentley

12-13. MINOR PROBLEMS (ADVANCED LABORATORY).—The formulation of methods suitable to new problems, and the conduct of small investigations. At the discretion of the department studies in the current literature or the presentation of essays upon historical subjects may be substituted for laboratory problems. *I, II*; *(2-5).

Prerequisite: Psychology 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	12	*2 to 5	—					(Arrange)		507 U. H.	Bentley, Ruckmich

SECOND SEMESTER

Psychology	13	*2 to 5	—					(Arrange)		507 U. H.	Bentley, Ruckmich
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*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

[15. THE PSYCHOLOGICAL BASIS OF MUSIC.—An elementary course. Summary of experimental and theoretical literature on the origin of music, harmony, melody, rhythm, consonance, tonal quality; psychology of musical appreciation and performance. *II*; (2). Not given in 1914-1915.]

17. THE HISTORY OF PSYCHOLOGY.—The rise and development, in recent times, of the science of psychology. Lectures and reading. *II*; (2).

Prerequisite: Psychology I, 2, and one other course.

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Psychology	17	2	—	11	—	11	—	—	—	417 U. H.	Ruckmich

19-20. SYSTEMATIC PSYCHOLOGY.—The nature of psychological analysis; classification of elementary processes; description of sensory and imaginal processes and the simpler complexes based upon historical and current researches. Lectures and essays. (For advanced students.) *I, II*; (3).

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Psychology	19	3	—	—	9	—	9	—	9	417 U. H.	Ruckmich

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Psychology	20	3	—	—	9	—	9	—	9	417 U. H.	Bentley

COURSES FOR GRADUATES

103. RESEARCH.—Experimental and historical investigations. Theses offered for advanced degrees. *I, II*.

BOTH SEMESTERS

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Psychology	103	—	—	—	—	—	—	—	—	(Arrange)	Bentley, Ruckmich

105. SEMINAR.—Weekly meetings for the discussion of current topics considered in their historical setting. *I, II*.

BOTH SEMESTERS

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Psychology	105	—	—	—	—	—	—	—	—	(Arrange)	Bentley

RAILWAY ENGINEERING

*WILLIAM FREEMAN MYRICK GOSS, M.S., D.Eng., *Director, Professor*

EDWARD CHARLES SCHMIDT, M.E., *Professor*

JOHN McBEATH SNODGRASS, B.S., *Assistant Professor, Railway Mechanical Engineering*

ALONZO MORRIS BUCK, M.E., *Assistant Professor, Railway Electrical Engineering*

ARTHUR FRANCIS COMSTOCK, C.E., *Associate, Railway Civil Engineering*

ROBERT BROWDER KELLER, B.S., *First Assistant, Engineering Experiment Station*

HAROLD HOUGHTON DUNN, B.S., *Assistant, Engineering Experiment Station*

*On leave, first semester.

Railway Civil Engineering—Courses 31-51.

Railway Electrical Engineering—Courses 60-68.

Railway Mechanical Engineering—Courses 1-10.

Common to all groups—Courses 25 and 30.

1. LOCOMOTIVES.—The mechanics of the locomotive, and problems relating to its operation. The development of locomotive types. *I*; (2).

Prerequisite: Theoretical and Applied Mechanics 29; Mechanical Engineering 64, 11, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	1	2	—	—	11	—	11	—	—	105 T. B.	Schmidt

2. LOCOMOTIVE DESIGN.—Calculations and designs of engine and boiler details; current standards and proportions. *I*; (3).

Prerequisite: Mechanical Engineering 64, 4, 5, 11, 2; registration in Railway Engineering 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	2	3	W	1-4	—	1-4	—	1-4	—	103 T. B.	Snodgrass

3. SHOPS AND AUXILIARY EQUIPMENT.—The design and equipment of railway shops and roundhouses and their organization; water purifying plants; pumping stations; air-brake equipment. *II*; (2).

Prerequisite: Mechanical Engineering 64, 4; Chemistry 1a or 1b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	3	2	W	—	10	—	10	—	—	203 T. B.	Snodgrass

4. LOCOMOTIVE PERFORMANCE.—Locomotive boiler and engine performance; the influence upon performance of combustion rate, steam pressure, speed, cut-off, etc.; compounding and superheating. *I*; (2).

Prerequisite: Theoretical and Applied Mechanics 21; Mechanical Engineering 64, 4, 5, 11, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	4	2	W	—	1-4	—	1-4	—	—	103 T. B.	Snodgrass

6. LOCOMOTIVES.—The mechanics of the locomotive; locomotive performance and general design. *II*; (4).

Prerequisite: Theoretical and Applied Mechanics 21, 29; registration in Mechanical Engineering 12 and 61.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	6	4	W	8	9	—	8-11	9	—	105 T. B.	Schmidt

7. ADVANCED DESIGN.—Problems in locomotive and car design. *II*; (3).

Prerequisite: Railway Engineering 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	7	3	W	8-11	—	8-11	—	8-11	—	103 T. B.	Snodgrass

8. DYNAMOMETER CAR TESTS.—Investigation of train resistance and locomotive tractive effort by the use of the railway test car. Analysis of the results and their application to the problems of tonnage rating. *I*; (2).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	8	2	W	8	—	—	8	—	—	105 T. B.	Keller

9-10. SEMINAR.—Discussion of current topics and review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	9	1	W	—	9	—	—	—	—	105 T. B.	Schmidt, Snodgrass

SECOND SEMESTER

Ry. E.	10	1	W	—	—	—	—	11	—	105 T. B.	Schmidt, Snodgrass
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25. RAILWAY DEVELOPMENT.—History and organization of steam and electric railways; statistics; costs. *I*; (3).

Prerequisite: Open to juniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	25	3	UVW	—	10	—	10	—	11	105 T. B.	Buck, Comstock

30. THESIS.—Independent solution of some railway problem or the investigation of some subject. The thesis may consist of an original design or of an original experimental investigation, or it may be the analysis and discussion of facts already in existence. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	30	3	—	—	—	—	—	—	—	(Arrange)	Schmidt, Snodgrass, Buck, Comstock, Keller

31. RAILWAY YARDS AND TERMINALS.—The theory of yard and terminal design; arrangement of grades in gravity yards; problems in yard design. *II*; (3).

Prerequisite: Civil Engineering 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	31	3	U	10	9-12	10	—	—	—	203 T. B.	Comstock

32. RAILWAY CONSTRUCTION.—Advanced course in the design of railway structures; study of cost analysis; preparation of estimates of cost, complete working drawings, and contracts and specifications for assigned problems in design. *II*; (2).

Prerequisite: Civil Engineering 51.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	32	2	U	—	1-4	—	1-4	—	—	103 T. B.	Comstock

33. ECONOMIC THEORY OF RAILWAY LOCATION.—Influence of volume of traffic, alignment, and gradient upon operating expenses; locomotive and grade problems; relocation of existing lines. *I*; (4).

Prerequisite: Civil Engineering 51; Theoretical and Applied Mechanics 20, 21.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	33	4	U	1-4	11	11	11	—	—	203 T. B.	Comstock

34. RAILWAY MAINTENANCE.—Systems of maintenance and organization; track design; maintenance standards and charts; classification of accounts; measuring efficiency of maintenance; emergency organization. *II*; (4).

Prerequisite: Civil Engineering 51.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	34	4	U	—	—	1-4	9	10	9	203 T. B.	Comstock

35. RAILWAY SIGNALING.—Principles of block and route signaling; systems of signaling in current use; history of signal development; study of railway accidents. *I*; (1).

Prerequisite: Civil Engineering 51.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	35	1	—	—	—	—	—	11	—	203 T. B.	Comstock

50-51. SEMINAR.—Discussion of current topics and review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	50	1	—	—	9	—	—	—	—	203 T. B.	Comstock

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	51	1	—	—	—	—	—	11	—	203 T. B.	Comstock

60. ELECTRIC RAILWAY PRINCIPLES.—Mechanics of traction; train resistance; braking of electric railway trains; methods of solving fundamental electric railway problems. *II*; (2).

Prerequisite: Theoretical and Applied Mechanics 25; Electrical Engineering 25, 22.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	60	2	—	—	10	—	10	—	—	105 T. B.	Buck

61. ELECTRIC TRACTION.—Selection and operation of electric railway equipment. A condensed course, arranged for students in railway mechanical engineering or other engineering departments. *II*; (3).

Prerequisite: Theoretical and Applied Mechanics 21; Electrical Engineering 12, 11 or 25, 24.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	61	3	—	—	8	—	8	—	8	105 T. B.	Buck

63. ELECTRIC RAILWAY LABORATORY.—Laboratory tests of electrical machinery used in railway service; work with the electric and steam railway test cars to determine train resistance and power consumption. *II*; (3).

Prerequisite: Railway Engineering 64; Electrical Engineering 24.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	63	3	—	—	1-4	—	1-4	—	—	E. E.	Buck

64. ELECTRIC RAILWAY PRACTISE.—Types of electric railway equipment; energy consumption; methods of distribution for electric roads. *I*; (3).

Prerequisite: Theoretical and Applied Mechanics 21; Electrical Engineering 5, 23.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	64	3	—	9	—	9	—	9	—	105 T. B.	Buck

65. ELECTRIC RAILWAY ECONOMICS.—Principles of electric railway location and operation; choice of systems; location of power plant and sub-stations; calculation of transmission and distribution of circuits; maintenance of way and of equipment; electrification of steam roads. *II*; (3).

Prerequisite: Railway Engineering 64.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	65	3	—	9	—	9	—	9	—	203 T. B.	Buck

67-68. SEMINAR.—Discussion of current topics and review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	67	1	—	—	9	—	—	—	—	214 T. B.	Buck

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	68	1	—	—	—	—	—	10	—	203 T. B.	Buck

COURSES FOR GRADUATES

Entrance upon graduate work in railway engineering presupposes the full undergraduate course in that subject.

102. LOCOMOTIVE DESIGN.—Modern practise concerning steam pressure, compounding, superheating.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	102	—	—							(Arrange)	Goss

106. LOCOMOTIVE OPERATION.—Determination of train resistance and locomotive tractive effort; application of these and other matters in the establishment of tonnage ratings.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	106	—	—							(Arrange)	Schmidt

108. ELECTRIC RAILWAY PRACTISE.—The design, selection, operation, and maintenance of electric railway equipment; central station, sub-station, rolling stock, and line equipment.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	108	—	—							(Arrange)	Buck

110. RAILWAY LOCATION.—The effects of the location of a railway upon its earning capacity; the engineering and economic problems met with in original location, as well as in the relocation and reduction of grades of existing lines.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	110	—	—							(Arrange)	Comstock

ROMANCE LANGUAGES AND LITERATURE*

THOMAS EDWARD OLIVER, Ph.D., *Professor*

DAVID HOBART CARNAHAN, Ph.D., *Associate Professor*

JOHN DRISCOLL FITZ-GERALD, II., Ph.D., *Assistant Professor*

DAVID SIMON BLONDHEIM, Ph.D., *Assistant Professor*

ARTHUR ROMEYN SEYMOUR, Ph.D., *Associate*

OLIN HARRIS MOORE, Ph.D., *Instructor*

THOR GRIFFITH WESENBERG, A.M., *Assistant*

CONRAD JOSEPH EPPELS, *Assistant*

CHARLES SEROPHIN CARRY, B.ès L., *Assistant*

LOUIS ALLEN, A.B., *Assistant*

JAMES KESSLER, A.B., *Assistant*

A major in French or Romance Languages consists of 20 hours chosen from the courses announced below except French 1a and 1b, 2c and 2d, and 9a and 9b, and Spanish 1a and 1b.

A minor for students taking a major in French or Romance languages must include at least 8 hours of Latin in addition to 3 years of high school Latin. The remaining 12 hours may be chosen from not more than two of the following subjects: education; English, excluding 1a and 1b, and Rhetoric 1 and 2; German, excluding German 1, 2, and 3; history; Italian; philosophy; and Spanish, excluding 1a and 1b.

Honors: Candidates for honors in French must offer:

1. A major in French.

*The department is administered by the following committee: Associate Professor D. H. Carnahan, Chairman, Professor Thomas E. Oliver, Assistant Professor John D. Fitz-Gerald.

2. At least 12 hours in Latin, in addition to three years of high school Latin.

3. At least ten hours in one of the following subjects: German, excluding German 1, 2, and 3; Spanish, excluding Spanish 1a and 1b; Italian; English literature, excluding English 1 and 2; history; and philosophy.

A. FRENCH

COURSES FOR UNDERGRADUATES

1a-1b. ELEMENTARY COURSE.—Grammar; pronunciation; reading of simple modern authors; composition; conversation. *I, II; (4).*

[For students who have had one year of high school French, or French 1a, or French SI, a section of 1b is offered in the first semester, as indicated below.]

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	1a	4	A	—	8	8	8	8	—	208 U. H.	Eppels
			B	—	8	8	8	8	—	206 U. H.	Kessler
			C	—	8	8	8	8	—	311 U. H.	Allen
			D	—	9	9	9	9	—	207 U. H.	Carry
			E	—	10	10	10	10	—	207 U. H.	Moore
			F	—	10	10	10	10	—	206 U. H.	Carnahan
			G	—	11	11	11	11	—	208 U. H.	Eppels
			H	1	1	1	1	—	—	208 U. H.	Eppels
			I	1	1	1	1	—	—	207 U. H.	Carry
			K	1	1	1	1	—	—	214 U. H.	Allen
			L	2	2	2	2	—	—	206 U. H.	Kessler

For Students in Engineering.

			R	—	9	9	9	9	—	208 U. H.	Kessler
			S	—	11	11	11	11	—	207 U. H.	Allen
			T	2	2	2	2	—	—	208 U. H.	Carry
French	1b	4	—	1	1	1	1	—	—	206 U. H.	Oliver

SECOND SEMESTER

French	1b	4	—	Sections and schedule the same as for 1a (first semester).							
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2a-2b. MODERN PROSE, POETRY, AND DRAMA.—Rapid reading of modern authors; advanced syntax and composition. *I, II; (4).*

Prerequisite: French 1a, 1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	2a	4	A	—	8	8	8	8	—	420 U. H.	Moore
			B	—	9	9	9	9	—	214 U. H.	Blondheim
			C	—	11	11	11	11	—	419 U. H.	Oliver
			D	2	2	2	2	—	—	207 U. H.	Blondheim

SECOND SEMESTER

French	2b	4	—	Sections and schedule the same as for 2a (first semester).							
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2C-2d. SECOND-YEAR CONVERSATION.—Mainly classroom work. (Does not count toward a major in French.) *I, II; (1).*

Prerequisite: French 1a, 1b, with a grade of at least 85; registration in French 2a, 2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	2c	1	—	—	9	—	9	—	—	117 L. H.	Eppels

SECOND SEMESTER

French	2d	1	—	Schedule the same as for 2c (first semester).							
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3a-3b. INTERMEDIATE PROSE COMPOSITION AND CONVERSATION.—Conducted entirely in French, giving facility in idiomatic expression in writing and speaking. Reading; themes; talks upon France and French life. *I, II; (2).*

Prerequisite: French 2a-2b.

NOTE: This course is required of those who expect the recommendation of the department to teach French.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	3a	2	—	—	10	—	10	—	—	211 L. H.	Carry

SECOND SEMESTER

French	3b	2	—	Schedule the same as for 3a (first semester).							
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[4a-4b. ADVANCED COMPOSITION.—*I, II; (2).* Not given in 1914-15.]

9a-9b. MASTERPIECES OF ROMANCE LITERATURES IN ENGLISH TRANSLATIONS.—Dante, Petrarch, Boccaccio, Cervantes, Rabelais, Montaigne, Moliere, and other writers. (This course may not be counted toward a major in French.) *I, II; (2).*

Prerequisite: Two years of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	9a	2	—	—	11	—	11	—	—	211 L. H.	Moore

SECOND SEMESTER

French	9b	2	—	Schedule the same as for 9a (first semester).							
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22a-22b. MODERN NOVEL AND DRAMA.—The novel and drama in France from the beginning of the nineteenth century to the present time. Lectures; reports on collateral reading. *I, II; (3).*

Prerequisite: French 2a-2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	22a	3	—	11	—	11	—	11	—	211 L. H.	Fitz-Gerald

SECOND SEMESTER

French	22b	3	—	Schedule the same as for 22a (first semester).							
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25. COURSE FOR TEACHERS.—The various methods of teaching French in this country and abroad; actual contact with class-room problems. *I; (2).*

Prerequisite: Twenty-four hours' credit in French.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
French	25	2	—	—	9	—	9	—	—	311 L. H.	Carnahan

28a-28b. SENIOR THESIS.—Intended primarily for candidates for honors in French, but open to other seniors. *I, II; (I).*

FIRST SEMESTER.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	28a	—	---							(Arrange)	Members of the department

SECOND SEMESTER

French 28b — — Schedule the same as for 28a (first semester).

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES.

IOa-IOb. GENERAL SURVEY OF FRENCH LITERATURE.—Special periods and authors. The main currents of French literature from the beginning to the present time. *I, II; (3).*

Prerequisite: French 22a-22b, or 24a-24b.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
French	10a	3	—	9	—	9	—	9	—	211 L. H.	Carnahan

SECOND SEMESTER

French	10b	3	—	Schedule the same as for 10a (first semester).
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[23a-23b. MODERN FRENCH POETRY.—*I, II*; (3). Not given in 1914-15.]

24a-24b. SEVENTEENTH AND EIGHTEENTH CENTURY DRAMATISTS.—Corneille, Racine, Molière, Voltaire, Marivaux, Sedaine, Beaumarchais. Lectures and interpretation of the great masterpieces. *I, II; (2).*

Prerequisite: French 2a-2b.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
French	24a	2	—	—	9	—	9	—	—	211 L. H.	Oliver

SECOND SEMESTER

French	24b	2	—	Schedule the same as for 24a (first semester).
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26a-26b. FRENCH LITERARY CRITICISM.—History of criticism in antiquity and in the Italian Renaissance; the principal French critics; the seventeenth and the nineteenth centuries in connection with the development of classicism and romanticism. *I, II; (2).*

Prerequisite: Three years of French, and senior standing.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
French	26a	2	—	—	10	—	10	—	—	117 L. H.	Blondheim

SECOND SEMESTER

French	26b	2	—	Schedule the same as for 26a (first semester).
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COURSES FOR GRADUATES

Before entering upon the study of Romance languages for an advanced degree, the candidate must have had a total of at least thirty hours of college work in these languages. Eighteen of these hours must be in one of these three languages, French, Italian, or Spanish, but no candidate will be received who has not had at least twelve hours in French. In addition a candidate must have had good training in Latin, and be able to read ordinary German prose.

102. OLD FRENCH LYRIC AND PROSE LITERATURE.—Critical interpretation of the earlier Old French dramatists, didactic, chronicle and lyric writers. Collateral study of the history of these types of medieval literature. For such students as prefer it, the collateral work may consist of the elements of Old French historical grammar. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	102	1 unit	—							(Arrange)	Oliver

103. SEVENTEENTH CENTURY PROSE WRITERS.—Lectures on French culture, society and prose literature of the seventeenth century. The great preachers and moralists. Jansenism and Port Royal. The formation of the classic ideals. Collateral readings of the greater masterpieces, with assigned problems for special investigation. *Once a week; I, II; (½ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	103	½ unit	—							(Arrange)	Oliver

106. EARLY FRENCH DRAMA.—A study of the origins of the drama in France, and its development up to the Renaissance. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	106	1 unit	—							(Arrange)	Carnahan

119. OLD FRENCH PHONOLOGY AND MORPHOLOGY.—Development of Old French from Vulgar Latin. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	119	1 unit	—							(Arrange)	Blondheim

125. SEMINAR.—Research work in preparation for theses in the field of the Romance languages. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	125	1 unit	—							(Arrange)	Members of the department

B. ITALIAN

[1a-1b. ELEMENTARY COURSE.—I, II; (3). Not given in 1914-1915.]

2a-2b. ITALIAN LITERATURE.—First semester: Rapid reading from the works of the principal Italian writers of the nineteenth century. Second semester: Introduction to the works of Dante, Petrarch and Boccaccio with selected readings. *I, II*: (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Italian	2a	2	—						(Arrange)		Moore
SECOND SEMESTER											
Italian	2b	2	—						(Arrange)		Moore

COURSES FOR UNDERGRADUATES

Subject	FIRST SEMESTER										Instructor
	No.	Credits	Section	M	T	W	T	F	S	Room	
Spanish	1a	4	A	—	8	8	8	8	—	207 U. H.	Seymour
			B	—	9	9	9	9	—	206 U. H.	Wesenberg

R	—	11	11	11	11	—	206 U. H.	Wesenberg
S	1	1	1	1	—	—	419 U. H.	Wesenberg

Spanish	1b	4	—	Sections and schedule the same as for 1a (first semester).
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Prerequisite: Spanish 1a, 1b.

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Spanish	2a	3	—	9	—	9	—	9	—	117 L. H.	Seymour

Spanish	2b	3	—	Schedule the same as for 2a (first semester).
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Prerequisite: Spanish 1a, 1b.

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Spanish	3a	2	—	—	10	—	10	—	—	212 L. H.	Fitz-Gerald

Spanish	3b	2	—	Schedule the same as for 3a (first semester).
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4a-4b. **ADVANCED CONVERSATION AND COMPOSITION.**—Commercial correspondence; reading of commercial Spanish. (Conducted in Spanish.) *I, II; (2).*

Prerequisite: Spanish 2a, 2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	4a	2	—	—	—	10	—	10	—	117 L. H.	Seymour

SECOND SEMESTER

Spanish	4b	2	—	Schedule the same as for 4a (first semester).							
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COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES.

11-12. **THE SPANISH DRAMA OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.**—Earlier dramatists; representative plays of Lope de Vega, Calderon, Ruiz de Alarcon and Triso de Molina. Reports on additional plays read outside of class. *I, II; (2).*

Prerequisite: Spanish 3a, 3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	11	2	—	—	—	—	—	—	—	(Arrange)	Seymour

SECOND SEMESTER

Spanish	12	2	—	Schedule the same as for 11 (first semester).							
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[15. **GENERAL SURVEY OF SPANISH LITERATURE.**—*II; (2).* Not given in 1914-1915.]

COURSES FOR GRADUATES

131. **OLDEST MONUMENTS OF THE SPANISH LANGUAGE; ORIGINS OF SPANISH POETRY.**—Historical grammar and paleography; critical interpretation of texts. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	131	1 unit	—	3	—	3	—	—	—	212 L. H.	Fitz-Gerald

133. **ORIGINS OF THE SPANISH NOVELA AND OF THE COMEDIA.**—In lectures and readings the development of Spanish prose fiction and of Spanish dramatic art will be studied for the period previous to the Golden Age. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	133	1 unit	—	—	3	—	3	—	—	212 L. H.	Fitz-Gerald

134. **THE SPANISH BALLAD.**—Lectures on the development of the various types of the ballad in Spain. Extensive collateral reading with reports. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	134	1 unit	—	—	—	—	—	—	—	(Arrange)	Seymour

SOCIOLOGY

EDWARD CARY HAYES, Ph.D., *Professor*HENRY HORACE HIBBS, Jr. A.M., *Assistant*

A major in sociology may be made up from any of the courses for undergraduates in the following announcement:

The minor subjects may be selected, with the approval of this department, from the following: history, economics, political science, philosophy, and psychology. All candidates must have taken elementary psychology.

For honors in sociology twenty-four hours in the department are required, including Sociology 1, 3, 8, and 9.

COURSES FOR UNDERGRADUATES

1. THE PRINCIPLES OF SOCIOLOGY AND THEIR APPLICATION TO PRESENT PROBLEMS.—*I*; (3).

Prerequisite: Junior standing, including if possible the principles of economics and elementary psychology.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	1	3	—	11	—	11	—	11	—	306 L. H.	Hayes

7. THE SOCIAL PROBLEMS OF THE RURAL COMMUNITY.—*II*; (2).

Prerequisite: Junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	7	2	—	—	11	—	11	—	—	306 L. H.	Hayes

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES.

3. SOCIAL EVOLUTION.—Modes of social activity among people at different stages of progress: savage, barbarous, and civilized; family organization, practical arts, economic wants and institutions, origins of government and law, codes of morality, religions; inductions from such facts, as to the theory of social evolution and the method of progress. *II*; (3).

Prerequisite: Sociology 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	3	3	—	11	—	11	—	11	—	306 L. H.	Hayes

8. GENERAL CHARITIES.—Evolution of modern organized philanthropy, public and private, causes and prevention of poverty; organization and management of charitable institutions. *I*; (3).

Prerequisite: Junior standing and Sociology 1 or Economics 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	8	3	—	8	—	8	—	8	—	306 L. H.	Hibbs

9. **CRIMINOLOGY.**—Nature, causes, and treatment of the criminal; evolution of modern methods of criminal procedure and penology; recent experiments and tendencies. *II*; (3).

Prerequisite: Senior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	9	3	—	8	—	8	—	8	—	306 L. H.	Hibbs

10. **POPULATION.**—Theories and policies of population; Malthus' Principle and its critics; problems in population of the United States; immigration, race-mixture, conditions affecting public health, death-rate, birth-rate, "race-suicide", marriage, divorce; selective influences at work on the "Population type". *I*; (3).

Prerequisite: Senior standing and Sociology I or Economics I.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	10	3	—	3	—	3	—	3	—	306 L. H.	Hibbs

11. **PRINCIPLES OF SOCIOLOGY.**—Fundamental principles and main teachings of sociology, derived from a minute analysis and classification of the elements that make up the life of a people, types of change to which they are subject, and causes by which they are affected. *I*; (3).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	11	3	—	—	11	—	11	—	11	306 L. H.	Hayes

[15. **THE FAMILY.**—Evolution of the family and marriage; educational, moral, and political significance of the family at different stages of social development. *II*; (3). Not given in 1914-15.]

14. **SOCIAL STATISTICS.**—Principles and methods of social investigation and social research. Social and community surveys. The verification of sociological laws and principles by means of the statistical method. The study of vital statistics and population in the light of data afforded by official publications and special investigations. Exercises designed to apply the statistical method to the study of sociology and social problems and to render the student familiar with sources of information. *II*; (3).

Prerequisite: Senior standing and Sociology I or Economics I, and, except in special cases, Sociology 10.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	14	3	—	3	—	3	—	3	—	306 L. H.	Hibbs

[26. **SOCIAL EDUCATION.**—Education as a factor in social progress; present day educational policy and organization in the light of theoretical and applied sociology. *II*; (3). Not given in 1914-15.]

Prerequisite: Senior standing, and Sociology I or Psychology I.]

COURSES FOR GRADUATES

Preparation for graduate work in sociology must include at least the equivalent of twelve semester hours in the social sciences, of which at least three must

be in sociology, and three in the principles of economics. The remainder may be in any combination of these two subjects, or of history and political science.

[101. SOCIOLOGICAL METHOD.—The method of advancing the science of sociology; adaptability to sociological investigation of certain methods described in Pearson's *Grammar of Science*, Wundt's *Methodenlehre*, zweite abtheilung, Seignobos' *La Méthode Historique Appliquée aux Sciences Sociales*, Bernheim's *Historische Methode*, Spencer's *Study of Sociology*, and Giddings' *Inductive Sociology*. *Three times a week; I; (1 unit)*. Not given, 1914-15.]

102. THE DEVELOPMENT OF SOCIOLOGY.—Readings in the works of writers who have contributed most to the development of sociology; discussions; supplementary lectures. *Twice a week; I, II; (1 unit)*.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	102	1 unit	—							(Arrange)	Hayes

150. SEMINAR.—*Three to six hours a week; I, II; (1 or 2 units)*.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	150	1 or 2 units	—							(Arrange)	Hayes

VETERINARY SCIENCE

DONALD MCINTOSH, V.S., *Professor*

4. ANATOMY, PHYSIOLOGY, AND DISEASES OF DOMESTIC ANIMALS.—The organs of mastication, digestion, respiration; circulation, and lymphatic system; the urinary organs; the skin. *I; (5)*.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Veterinary Science	4	5	A	9	9	9	9	9	—	553 Ag.	McIntosh
			B	11	11	11	11	11	—	553 Ag.	McIntosh

5. ANATOMY, PHYSIOLOGY, AND DISEASES OF DOMESTIC ANIMALS.—The nervous system, bones, joints, feet, eye, and generative organs; epizootic and contagious diseases; catarrhal fever; pyemia; septicaemia; rheumatism; tuberculosis; fistula of the withers; poll-evil; wounds; internal parasites. *II; (5)*.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Veterinary Science	5	5	A	9	9	9	9	9	—	553 Ag.	McIntosh
			B	11	11	11	11	11	—	553 Ag.	McIntosh

6. CLINIC.—The free clinic is held every Saturday morning from ten to twelve o'clock. Animals are brought to be examined, operated upon, and prescribed for. This class is of signal benefit to the student as he has the opportunity of seeing the cases and of assisting in the work. *I, II; (1)*.

Prerequisite: Registration in Veterinary Science 4 and 5.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Veterinary Science	6	1	—	—	—	—	—	—	10, 11	—	McIntosh

ZOOLOGY

HENRY BALDWIN WARD, Ph.D., *Professor*
 JOHN STERLING KINGSLEY, D.Sc., *Professor*
 FRANK SMITH, A.M., *Professor*
 CHARLES ZELNY, Ph.D., *Associate Professor*
 VICTOR ERNEST SHELFORD, Ph.D., *Assistant Professor*
 HARLEY JONES VANCLEAVE, Ph.D., *Instructor*
 HENRY GUSTAV MAY, B.S., *Research Assistant*
 BESSIE ROSE GREEN, A.M., *Assistant*
 RALPH HARLAN LINKINS, A.M., *Assistant*
 HARRY VIRL HEIMBURGER, A.B., *Assistant*
 HOMER ELDON CHENOWETH, A.B., *Graduate Assistant*
 HARRIET BELL MERRILL, M.S., *Graduate Assistant*
 JESSE LEROY CONEL, A.M., *Graduate Assistant*
 THOMAS BYRD MAGATH, M.S., *Graduate Assistant*
 GEORGE MARSH HIGGINS, B.S., *Graduate Assistant*
 _____, *Graduate Assistant*

Courses 1 and 2 constitute a general survey of the subject, extending through the entire year, and form the best introduction to later work in zoology. In the second year, a student may choose as a line of work either morphological, experimental, ecological, faunistic, or systematic courses. The courses on microscopical technique (3), heredity and evolution (5), and current literature (20) are of especial value for all students. Medical students should take courses 3 and 6 the second year. Those preparing to teach zoology in the high school will find invertebrate morphology (4), field zoology (16, 17), and ecology (9, 11) of especial value, and should not overlook the importance of a course in general entomology.

COURSES FOR UNDERGRADUATES

I. GENERAL ZOOLOGY.—Animal biology; general principles of structure; function and inter-relations of animal forms; origin and development of animal life; the simpler and best-established generalizations in zoological theory. Lectures; laboratory; quiz work. *I or II*; (5).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	1	5	Lecture	9	—	9	—	9	—	228 N. H.	Ward
			A, Laboratory	—	8,9	—	8,9	—	8,9	312 N. H.	Shelford VanCleave and Assistants
			B, Laboratory	10,11	—	10,11	—	10,11	—	312 N. H.	
			C, Laboratory	1,2	—	1,2	—	1,2	—	312 N. H.	
			D, Laboratory	—	10,11	—	10,11	—	10,11	312 N. H.	
			E, Quiz	—	—	—	8	—	—	—	
			F, Quiz	—	—	—	—	8	—	—	
			G, Quiz	—	1	—	—	—	—	—	
			H, Quiz	—	—	—	1	—	—	—	

2. VERTEBRATE ZOOLOGY AND COMPARATIVE ANATOMY.—Classification of the Chordata; the early stages of vertebrate embryology; structure of vertebrate tissues; systems of organs considered in respect to their anatomy, function, onto-

geny, and evolution in the vertebrate series; anatomical studies of selected types of the Chordata. Lectures; laboratory; quiz work. *II*; (5).

Prerequisite: Zoology I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	2	5	Lecture	10	—	10	—	10	—	229 N. H.	Kingsley
			A, Laboratory	8,9	—	8,9	—	8,9	—	403 N. H.	Kingsley
			B, Laboratory	—	10,11	—	10,11	—	10,11	403 N. H.	and Assistants

4. INVERTEBRATE MORPHOLOGY.—A laboratory study in the morphology of a series of invertebrates, together with lectures and demonstrations upon the problems of invertebrate structure and development, with special emphasis upon the application of general biological principles. *II*; (3).

Prerequisite: Zoology I.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	4	3	—	—	1,2,3	—	1,2,3	—	—	312 N. H.	VanCleave

5. HEREDITY AND EVOLUTION.—(a) The facts of heredity and present views regarding them. (b) The proofs of organic evolution with a discussion of the probable factors involved in the process. Lectures; demonstrations; assigned reading. *II*; (2).

Prerequisite: One year of university work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	5	2	—	—	11	—	11	—	—	229 N. H.	Zeleny

16. FIELD ORNITHOLOGY.—The birds of the vicinity. Identification; food relations; seasonal distribution; migration activities. (Students are advised to provide themselves with opera or field glasses.) Field work; lectures. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	16	2	Lecture	3	—	—	—	—	—	229 N. H.	Smith
			(Choose any two)								
			Fields	—	8,9	—	8,9	—	8,9	—	Smith
				—	3,4	3,4	—	3,4	—	—	Smith

19a-19b. ADVANCED ORNITHOLOGY.—(Continuation of 16.) Difficult groups of birds; economic and technical literature. *I, II*; *(2 to 5).

Prerequisite: Zoology 16 or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	19a	*2 to 5	—	—	—	—	—	—	—	(Arrange)	Smith

SECOND SEMESTER

Zoology	19b	*2 to 5	—							(Arrange)	Smith
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*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

3. MICROSCOPICAL TECHNIQUE AND GENERAL VERTEBRATE EMBRYOLOGY.—Theory and practise of microscopical technique; vertebrate embryo in early stages of development; methods of fixation, embedding, section cutting, staining and mounting; preparation of embryological material for use in introductory embryology. Lectures; laboratory. *I*; (3).

Prerequisite: Zoology 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	3	3	—	—	1,2,3	—	1,2,3	—	—	403 N. H.	Kingsley

6. VERTEBRATE ORGANOGENY.—Development of the organs of the vertebrate body. Lectures; assigned readings in a text-book of vertebrate embryology; laboratory studies on embryos of the chick, dogfish, *Amblystoma*, and pig. (A continuation of course 3; for medical students and others.) *II*; (3).

Prerequisite: Zoology 1, 2, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	6	3	—	1,2	—	1,2	—	1,2	—	403 N. H.	Kingsley

9. ANIMAL ECOLOGY.—The relation of animals to their natural environment; processes of changes in environment and their influence upon animal life; the local fauna and the conditions under which it lives; methods of observation and making notes. Arthropods, mollusks, reptiles, amphibians, and fishes. Lectures; field work; laboratory, and assigned reading. *II*; (3).

Prerequisite: One year of zoology, or two years of university work, including Zoology 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
			Lecture	3	—	—	—	—	—	316 N. H.	Shelford
			Laboratory	—	1,2	—	1,2	—	—		Shelford
			or field	—	3,4	—	3,4	—	—		and Assistants

II. ANIMAL ECOLOGY AND GEOGRAPHY.—(Experimental Course).—The physiology of enviroic relations; facts, principles, and methods of analysis of behavior. The world and regional aspects of animal behavior and ecology; including animal distribution as related to climate and vegetation and some consideration of its origin and its dynamic relations. Lectures; laboratory work; field excursions. *I*; (5).

Prerequisite: Two years of university work; including Zoology 1 and 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	11	5	Lecture	3	—	—	—	—	—	316 N. H.	Shelford
			Laboratory	—	1-5	—	1-5	—	—	316 N. H.	Shelford

13. EXPERIMENTAL EMBRYOLOGY AND REGENERATION.—The factors concerned in individual development. Lectures; demonstrations. *I*; (2).

Prerequisite: Three years of university work, including one year in zoological courses.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	13	2	—	—	3	—	3	—	—	229 N. H.	Zeleny

14a-14b. EXPERIMENTAL EMBRYOLOGY AND REGENERATION.—(Laboratory.) Individual work on definite problems. *I, II*; *(2 to 5).

Prerequisite: Three years of university work, including one year in zoological courses.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	14a	*2 to 5	—	1,2,3	—	1,2,3	—	1,2,3	—	314 N. H.	Zeleny

SECOND SEMESTER

Zoology 14b *2 to 5 — Schedule the same as for 14a (first semester).

15. VARIATION AND HEREDITY.—The factors of organic evolution; the principles of animal breeding; eugenics. Lectures and demonstrations. *II*; (2).

Prerequisite: Three years of university work, including one year in zoological courses.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	15	2	—	—	3	—	3	—	—	229 N. H.	Zeleny

15a-15b. VARIATION AND HEREDITY.—(Laboratory.)—Individual work on definite problems. *I, II*; *(2 to 5).

Prerequisite: Three years of university work, including one year in zoological courses.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	15a	*2 to 5	—	1,2,3	—	1,2,3	—	1,2,3	—	314 N. H.	Zeleny

SECOND SEMESTER

Zoology 15b *2 to 5 — Schedule the same as for 15a (first semester).

17. FIELD ZOOLOGY.—Collection, preservation, and identification of common representatives of the lower vertebrates and of the various groups of land and fresh-water invertebrates (excluding insects) in the vicinity; identification work on living and preserved material from some of the larger rivers and lakes; observations on the habits and life histories of selected forms. Field and laboratory work; assigned readings. *I*; (4).

Prerequisite: One year in zoology, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	17	4	—	—	8,9	—	8,9	—	8-12	—	Smith

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

18. **ADVANCED FIELD ZOOLOGY.**—More restricted problems in connection with the local fauna; taxonomic or distributional problems. (A continuation of course 17.) *II*; *(3 to 5).

Prerequisite: Zoology 17.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	18	*3 to 5	—							316 N. H.	Smith

22-23. **MORPHOLOGY OF VERTEBRATES.**—The skeleton and the brain, the cranial nerves, and the eye and ear. Lectures; laboratory work; dissection of types. *I, II*; (4).

Prerequisite: Zoology 1, 2, 3 and 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	22	4	—							403 N. H.	Kingsley

SECOND SEMESTER

Zoology	23	4	—							403 N. H.	Kingsley
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21a-21b. **INTRODUCTION TO ZOOLOGICAL RESEARCH.**—Investigation of topics, usually repeating the work of earlier investigators; the morphology, life history, or reciprocal relations of invertebrate forms. Laboratory; conferences; assigned reading. *I, II*; *(2 to 5).

Prerequisite: One year in zoological courses, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	21a	*2 to 5	—							308 N. H.	Ward

SECOND SEMESTER

Zoology	21b	*2 to 5	—							308 N. H.	Ward
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20a-20b. **CURRENT LITERATURE.**—Meetings of the instructors and advanced students of the department for the presentation and discussion of the results of recent zoological investigation. (Open to all students of zoology; should be taken by those intending to graduate with a thesis.) *I, II*; (1).

Prerequisite: Three years of university work, including one year in zoology.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	20a	1	—	—	—	—	—	3	—	229 N. H.	Zeleny

SECOND SEMESTER

Zoology	20b	1	—	Schedule the same as for 20a (first semester).							
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8a-8b. **THESIS INVESTIGATION.**—Individual work on assigned topics. *I, II*; (5).

Prerequisite: Two years in zoological courses.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	8a	5	—								Ward Smith Kingsley Zeleny Shelford

SECOND SEMESTER

Zoology	8b	5	—								(Arrange).
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COURSES FOR GRADUATES

Two years of undergraduate work in zoology are ordinarily presupposed for entering upon graduate study in the department. When the work is chosen for a minor the courses listed for graduates and undergraduates, to be acceptable, must be preceded by at least one full year's undergraduate work in zoology. Work done at other institutions will be valued on conference with the head of the department.

102. SELECTED TOPICS FROM VERTEBRATE MORPHOLOGY.—Lectures and required reading on the origin of vertebrates, the segmentation of the head, the morphology of special systems, etc. *Twice a week; I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	102	$\frac{1}{2}$ unit	—							403 N. H.	Kingsley

107. PARASITOLOGY.—Structure and life history of animal parasites; their relations to disease; origin and biological significance of parasitism. Conferences; assigned readings; demonstrations. *Twice a week; I, II; (1 unit).* Given in 1914-1915 and in alternate years.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	107	1 unit	—	3	—	3	—	—	—	229 N. H.	Ward

109. ANIMAL RESPONSE.—The more advanced considerations of animal behavior; the regulatory mechanisms of organisms,—neutrality, osmotic pressure, immunity, temperature, etc., considered in relation to natural environments. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	109	1 unit	—							(Arrange)	Shelford

113. EXPERIMENTAL ZOOLOGY.—Assigned problems in experimental embryology, regeneration, variation, and heredity. *Two to five times a week; I, II; (1 to 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	113	1 to 2 units	—							314 N. H.	Zeleny

117. FAUNISTIC ZOOLOGY.—Problems in taxonomy, distribution, and ecology; field work, conference, and lectures. This work is favored by a natural history survey of the State now in progress at the University; students have the advantage of the collections, library, apparatus, and operation of this survey. *Twice a week; I, II; (1 to 2 units).*

BOTH SEMESTERS

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Zoology	117	1 to 2 units	—							(Arrange)	Smith
(a)	ZOOLOGICAL PROBLEMS.										Professor WARD
(b)	FAUNISTIC AND SYSTEMATIC ZOOLOGY.										Professor SMITH
(c)	ANIMAL ECOLOGY AND BEHAVIOR.										Professor SHELFORD
(d)	VERTEBRATE MORPHOLOGY.										Professor KINGSLEY
(e)	EXPERIMENTAL ZOOLOGY.										Associate Professor ZELNY

BOTH SEMESTERS

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Zoology	121	—	—							(Arrange)	—

[127. THEORIES OF ANIMAL PHYLOGENY.—Relations of various groups of animals; signification of so-called intermediate forms; study of invertebrate larval forms and of theories of descent based on them. Lectures; assigned readings; laboratory. *I, II*; (*1 unit*). Not given in 1914-1915. To be given in 1915-1916.]

Amesbury
Mass.
Oct 18 1881
Mr. H. W. H. H.
New York
N. Y.

Amesbury
Mass.
Oct 18 1881
Mr. H. W. H. H.
New York
N. Y.

Learning and Labor

University of Illinois

ANNOUNCEMENT OF COURSES

SEPTEMBER, 1915

DIRECTIONS FOR REGISTRATION
REQUIREMENTS FOR GRADUATION
DESCRIPTION OF COURSES

PUBLISHED BY THE UNIVERSITY
URBANA

my 16-c.c.

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EDMUND JANES JAMES, Ph.D., LL.D.

REGISTRATION CALENDAR

1915-1916

First Semester

1915

Sept. 13-17, Mon. to Fri.

Entrance examinations (get program at Registrar's Office)

Sept. 15, Wed.

Scholarship examinations for second nominees

Sept. 20, 21, Mon., Tues.

Registration Days

Sept. 20, Mon., 7 p. m.

Examination for exemption from Rhetoric 1

Sept. 22, Wed., 8 a. m.

Instruction begun

Sept. 25, Sat.

Assignments in the Regiments posted (Engineering Building, 1st floor, west end)

Sept. 27, Mon.

Military Drill (Mil. 2) and Hygiene lectures (P. T. 1a and 9) begun

Oct. 2, Sat., 5 p. m.

Latest date for rebates in full and for change of study-list without fee

Oct. 15, Fri.

Assignment of vacant agriculture and household-science scholarships

Oct. 22, Fri.

Latest date for removal of "incompletes"

Nov. 20, Sat., 5 p. m.

Latest date for rebates of one-half fees

1916

Feb. 2-5, Wed. to Sat.

Entrance examinations (get program at Registrar's Office)

Second Semester

Feb. 7, 8, Mon., Tues.

Registration Days

Feb. 9, Wed., 8 a. m.

Instruction begun

Feb. 19, Sat., 5 p. m.

Latest date for rebates in full and for change of study-list without fee

Mar. 10, Fri.

Latest date for removal of "incompletes" and for removal by seniors of first semester failures

Apr. 8, Sat.

Latest date for rebates of one-half fees

DIRECTORY OF REGISTRATION OFFICERS

<i>Information Office</i>	157 Administration Building
<i>Registrar's Office</i>	156 Administration Building
CHARLES MAXWELL MCCONN, A.M., <i>Registrar</i>	
HARRISON EDWARD CUNNINGHAM, A.B., <i>Assistant Registrar</i>	
LEVI AUGUSTUS BOICE, <i>Recorder</i>	
IRA MELVILLE SMITH, LL.B., <i>Examiner</i>	
GEORGE PHILIP TUTTLE, Jr., B.S., <i>Assistant Examiner</i>	
NOTE: For high-school and normal-school credits, see Mr. Smith; for advanced standing from other colleges, see Mr. Tuttle; for University of Illinois grades and credits, see Mr. Boice.	

OTHER GENERAL UNIVERSITY OFFICERS

<i>Cashier</i>	
MARSH EVERETT THOMPSON.....	156 Administration Building
<i>Dean of Men</i>	
THOMAS ARKLE CLARK, B.L., <i>Dean</i>	152 Administration Building
ARTHUR RAY WARNACK, A.B., <i>Assistant Dean</i> ..	152 Administration Building
<i>Acting Dean of Women</i>	
MARTHA JACKSON KYLE, A.M.....	102 Woman's Building
<i>Adviser to Foreign Students</i>	
ARTHUR ROMEYN SEYMOUR, Ph.D.....	153 Administration Building
<i>High School Visitor</i>	
HORACE ADELBERT HOLLISTER, A.M.....	253 Administration Building
<i>Director of Physical Training for Men</i>	
GEORGE A. HUFF.....	I Gymnasium
<i>Director of Physical Training for Women</i>	
LOUISE FREER, A.B., B.S.....	110 Woman's Building
<i>Commandant</i>	
Major FRANK DANIEL WEBSTER, U. S. A.....	112 Engineering Building
Sergeant FREDERICK WILLIAM POST, U. S. A., Ret'd,	
Administrative Assistant.....	112 Engineering Building

OFFICERS OF COLLEGES AND SCHOOLS

<i>College of Liberal Arts and Sciences</i>	
KENDRIC CHARLES BABCOCK, Ph.D., LL.D., <i>Dean</i>	304 University Hall
HOWARD VERNON CANTER, Ph.D., <i>Assistant Dean</i>	304 University Hall
<i>College of Commerce and Business Administration</i>	
NATHAN AUSTIN WESTON, Ph.D., <i>Acting Dean</i>	103 Commerce Building

School of Education

WILLIAM CHANDLER BAGLEY, Ph.D., <i>Director</i>	203	University Hall
WILFORD STANTON MILLER, A.M., <i>Secretary</i>	203	University Hall

School of Music

JOHN LAWRENCE ERB, F. A. G. O., <i>Director</i>	202	University Hall
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College of Engineering

WILLIAM FREEMAN MYRICK GOSS, M.S., D. Eng., <i>Dean</i>		
	300	Engineering Building
HARVEY WILLARD MILLER, M.E., <i>Assistant Dean</i> ...	300	Engineering Building

College of Agriculture

EUGENE DAVENPORT, M.Agr., LL.D., <i>Dean</i>	100	Agricultural Building
FRED HENRY RANKIN, <i>Assistant to the Dean</i>	100	Agricultural Building

College of Law

OLIVER ALBERT HARKER, A.M., LL.D., <i>Dean</i>	205	Law Building
WILLIAM GREEN HALE, LL.B., <i>Secretary</i>	206	Law Building

Library School

PHINEAS LAWRENCE WINDSOR, Ph.B., <i>Director</i>	318	Library Building
FRANCES SIMPSON, M.L., B.L.S., <i>Assistant Director</i>	320	Library Building

Graduate School

DAVID KINLEY, Ph.D., LL.D., <i>Dean</i>	109	Commerce Building
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GENERAL DIRECTIONS FOR REGISTRATION

To Every Student:

You should at once look over the **HEADINGS**, at least, of **ALL** the paragraphs, numbered 1-28, which follow. It is certain that one or two of them, and probable that several others, are **OF VITAL IMPORTANCE** to **YOU** individually at this time.

1. New Students without Permits to Register

A new student *who has not yet secured a permit to register* should proceed at once to the Registrar's Office, 156 Administration Building, taking with him his credit statements from all former schools attended (high school, academy, normal school, or college).

EXCEPTIONS

The foregoing direction applies to all new students without permits except:

- (1) GRADUATE STUDENTS—see the Graduate School Circular, copies of which may be obtained at Room 109 Commerce Building.
- (2) LIBRARY SCHOOL STUDENTS—see page 75.
- (3) APPLICANTS FOR ADMISSION AS "SPECIAL STUDENTS"—see paragraph 12.
- (4) STUDENTS DROPPED FROM OTHER INSTITUTIONS—see paragraph 8.
- (5) FOREIGN STUDENTS—see paragraph 9.

2. New Students with Permits to Register

A new student *who has already received a permit to register* need not go to the Registrar's Office, but will receive his study-list, together with further detailed instructions, at one of the following points, according to the college or school which his permit entitles him to enter:

College of Liberal Arts and Sciences, including Courses in Journalism, Chemistry, Chemical Engineering, Household Science, and Medicine—opposite the main entrance of University Hall.

College of Commerce and Business Administration—opposite the main entrance of the Commerce Building.

College of Engineering, including the Course in Ceramic Engineering—Engineering Hall.

College of Agriculture, including the Course in Household Science—opposite the main entrance of the Agricultural Building.

School of Music—Room 202, University Hall.

College of Law—Room 206, Law Building.

Library School—Room 320, Library Building.

Graduate School—Room 109, Commerce Building.

3. Former Students in Attendance Last Semester

A former student *in attendance the second semester of the year 1914-15*, and in all respects in good standing (see paragraph 5), should call for his study-list at one of the points mentioned in paragraph 2, according to the college or school in which he is enrolled.

4. Former Students Not in Attendance Last Semester

A former student *not in attendance the second semester of the year 1914-15*, but in all respects in good standing (see paragraph 5), must first secure a permit to re-enter, if a man, from the Dean of Men, if a woman, from the Dean of Women, and must then obtain a study-list at the Registrar's Office.

5. Former Students Not in Good Standing

A former student, whether or not in attendance the preceding semester, *if not in good standing*, either—

(a) Because he has been in attendance a year as a *conditioned freshman* and has not cleared off entrance conditions; or—

(b) Because he has been registered for two years as a *special student* without matriculating; or—

(c) Because he has been *dropped for poor scholarship* or *dismissed on disciplinary grounds*—may not register except upon the recommendation of the faculty of his college and with the approval of the Council of Administration, evidenced by a permit from the Secretary of the Council. Such a student should go first to see the dean or the assistant dean of his college.

6. Students Changing Colleges or Courses within the University

A student who desires to transfer from one college or school of the University of Illinois to another college or school of the University should (1) secure from the dean or director of the former college or school a statement of his record therein; (2) secure from the Registrar's Office a statement of his entrance credits, and (3) submit these papers to the dean of the college or the director of the school which he wishes to enter.

Any student who wishes to transfer from the course in which he was registered the last semester to another course *in the same college* should consult the dean or the assistant dean of his college.

7. Students with Advanced Standing

A student transferring from another university, a college, or a normal school should submit his credits from that institution, or his estimate of advanced standing, if he has already obtained an estimate from the Registrar, to his adviser when consulting the latter about his course. Then, whether he has already had an estimate made or not, he should call between October 1 and October 15 at the Registrar's Office to file a formal *petition* for transfer of credits. For the rules governing such transfers see the "*Regulations for the Guidance of Undergraduate Students*," Appendix I. It is impossible for the Registrar's Office to make up estimates of advanced standing on the registration days.

8. Students Dropped from Other Institutions

A student who has been dropped from another college or university, either for unsatisfactory scholarship or for disciplinary reasons, may be admitted to the University of Illinois only on the recommendation of the college which he desires to enter, approved by the Council of Administration. A student in this case should first see the dean or the assistant dean of the college of his choice and learn in consultation with him whether or not it is probably worth his while to file a *petition*.

9. Foreign Students

Students from foreign countries should consult first the Adviser for Foreign Students, Room 153, Administration Building.

10. Students Earning Their Way

Students who are making their own expenses, either in whole or in part, during the school year should state that fact to their advisers when making up their schedules. Experience has shown conclusively that such students should carry light work.

11. Persons Employed by the University

Any person in the regular employ of the University may be permitted to attend University classes for credit, provided he registers and pays a fee of \$7.50 for each study each semester.

12. Special Students

Persons over twenty-one years of age may be admitted as special students, provided they secure (1) the recommendation of the professor whose work they wish to take, and (2) the approval of the dean of the college in which the course is given. They must give evidence that they possess the requisite information and ability to pursue profitably, as special students, their chosen subjects, and must meet the special requirements of the particular college in which they wish to enroll.

A special student is not matriculated and must pay a tuition fee of \$7.50 a semester in addition to the regular incidental fee of \$12.00 a semester.

No one may enroll as a special student in any college or school of the University for more than two years, except by special permission, application for which must be made through the dean of the college.

A person registered as a special student in one college and desiring to take a course in another college of the University must obtain the approval of the dean of the latter college.

A person desiring admission as a special student should first see the dean or the assistant dean of the college he wishes to enter (see the directory on pages 6 and 7).

13. Conditioned Freshmen

*In 1915-16**, a student who lacks not more than one of the fifteen units required for matriculation may be entered as a conditioned freshman, provided—

- (a) He is enrolled in at least nine hours of work for university credit;
- (b) All his entrance conditions are such as can be made up during his first year.

No student having entrance conditions may continue a second year, except on the recommendation of the faculty of the college or school in which he is enrolled, approved by the Council of Administration. Petitions on the part of conditioned freshmen for permission to continue a second year are granted only in very exceptional cases.

Conditions may be made up by passing entrance examinations, which are held three times in each year—in January just before the beginning of the second semester, in July during the Summer Session, and in September during the week before the fall registration; or they may be made up, except in Eng-

**After September 1, 1916, no conditions will be permitted.* In other words, every student must then offer at the time of admission 15 units in acceptable subjects, including the 6 units specifically prescribed for all the undergraduate colleges. It is provided, however, that a student who offers 15 acceptable units including these 6 units, but is deficient not to exceed 2 units in subjects especially prescribed for the college or curriculum which he wishes to enter, may be admitted in that college or curriculum to courses for which he is fully prepared, subject to the requirement that the deficiencies in question shall be removed before he may register for a second year's work.

lish, and mathematics, by offering certain college courses for entrance credit, at the rate of one semester of college work for one unit of entrance credit.

In this way freshmen conditioned in *foreign languages* may offer German 1 or French 1a for 1 unit and German 1 and 3 or French 1a and 1b for 2 units.

Freshmen conditioned in *science* may offer Botany 1, Chemistry 1, or Zoology 1 for 1 unit each.

Students conditioned in English will not be admitted to English 10-11 or Rhetoric 1-2. Students conditioned in *English* or in *mathematics* may arrange for making up their conditions in these subjects by tutoring. Lists of tutors in these subjects who have been approved by the University may be obtained at the Registrar's Office or at the office of any one of the deans. It should be understood, however, that such tutors merely assist the student in preparing for the regular University entrance examinations; no tutor's work is "accredited," i. e., accepted without examination.

Students conditioned in *electives* may offer for entrance credit some one of the courses named above for which they have not had high-school equivalents.

14. Exemption from Rhetoric 1 by Examination

Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. An examination to test such proficiency will be given at 7:00 p. m. on the first day of registration (Monday, September 20) in room 228 Natural History Building. The results of this examination will be announced the following morning. Students who intend to try this examination should defer their registration until they learn whether or not they have passed in the examination.

15. Number of Hours* Prescribed

That the time of students may be fully occupied, each person is required to pursue studies aggregating *not less than fifteen nor more than eighteen hours**; except that students in courses requiring more than such number of hours in any semester are not limited as to such required hours by this rule; and excepting further that a student whose standing in each study of the preceeding semester has been 90 may take for the semester studies aggregating not more than twenty hours. A student may be permitted to take more or less than the amount of work prescribed above only on the permission of the dean of his college or the director of his school.

A student who cannot devote his entire time to his studies because of illness, outside work necessary to meet expenses, or other good reason, may be required by the dean of his college or the director of his school to take less than fifteen hours.

16. Required Subjects Take Precedence

Any required subject in which there is a failure must upon the first recurrence of such subject take precedence over all other subjects.

17. Credit Forfeited by Reregistering

By re-registering or taking a special examination in a subject for which he has received credit, a student forfeits his credit. When a course is thus repeated the grade given at the end of the repetition or as the result of the special examination becomes the official grade.

*Credit is reckoned in "semester hours," or simply "hours." An "hour" is one class period a week for one semester, each class period presupposing two hours' preparation by the student, or the equivalent in laboratory, shop, or drawing room.

18. Candidacy for Graduation

Candidates for graduation must have completed by the end of the first semester of the year of graduation all studies required therefor, except those to be taken in class in the second semester; provided, that a failure in the first semester's work may be made up not later than one month after the beginning of the second semester.

19. Courses with Variable Credit

In registering for a course with variable credit hours (e. g., Agronomy 13, 2-5 hours), a student must put down on his study-list the number of hours for which he intends to take the course; e. g., not 2-5, but 2 or 3 or 4 or 5.

20. Military and Physical Training for Men**(a) THE REQUIREMENT IN MILITARY**

All male students, citizens of the United States, except (1) students of the College of Law, (2) students over twenty-five years of age when entering the University, (3) students entering the University with junior standing, and (4) students who have had two years of military work at other institutions having a United States Army officer on duty as professor of military science, must register in military on entering the University, and, unless properly excused, must take the full course therein, whether they intend to graduate or not. To have any credits received for military work count for graduation, the full course must be taken. The classes of students excepted above may take military work if they so desire, by registering for it.

After registering in the military department, students physically disqualified, such disability to be certified by a reputable physician approved by the Council of Administration, may be excused from military work by petition submitted through the military office.

(b) THE REQUIREMENT IN PHYSICAL TRAINING (Men)

Freshmen take Physical Training throughout the year.

The Dean of Men may excuse from the required gymnasium practise such men students as are doing manual labor or present other legitimate reasons; he may also give permission to defer physical training for the current year.

(c) REGISTRATION IN MILITARY AND PHYSICAL TRAINING (Men)**First Semester**

Freshmen, first semester—register for *Military 2a* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Physical Training I* (Gymnasium Practise) and *1a* (Personal Hygiene)* as for any other sectional course.

Sophomores, not sergeants, first semester—register for *Military 2c* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday.

Sophomores who are sergeants and junior and senior officers, first semester—register for *Military 2c* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 3a* (Advanced Theoretical Instruction) as for any other sectional course.

**Physical Training 1a* (six lectures on Personal Hygiene by the Dean of Men) begins Monday, September 27, and extends through October, and *Physical Training I* (Gymnasium Practise, two hours a week) begins the first week in November.

Second Semester

Freshmen, second semester—register for *Military 2b* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 1* (Theoretical Instruction) and *Physical Training 2* (Gymnasium Practise) as for any other sectional courses.

Sophomores, not sergeants, second semester—register for *Military 2d* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday.

Sophomores who are sergeants and junior and senior officers, second semester, register for *Military 2d* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 3b* (Advanced Theoretical Instruction) as for any other sectional course.

(d) ASSIGNMENT TO COMPANIES

Assignment to companies in the Regiments will be made by the Commandant.

The assignments in the Regiments will be posted on the Military Bulletin Board on the first floor of Engineering Hall, west end, on Saturday, September 25. Military drill will begin on Monday, September 27.

(e) UNIFORMS

All students registering in Military for the first time must report *on the registration days* at Room 104, Engineering Hall, to be measured for uniforms.

A deposit of \$14.20, the cost of the uniform, payable with the other fees at registration, is required of students registering in Military for the first time.

21. Physical Training for Women

Freshmen women have Gymnasium Practise three hours a week throughout the year, and lectures on Hygiene by the Dean of Women at 4 o'clock on Monday throughout the first semester.

They should register for *Physical Training 9* (Hygiene) at 4 o'clock on Monday; and should register for *Physical Training 7a* (first semester) and *7b* (second semester)—Gymnasium Practise—as they would for any other sectional course.

The Dean of Women may excuse from the required gymnasium practise such women students as are doing manual labor or present other legitimate reasons; she may also give permission to defer physical training for the current year.

22. Late Registration

A student registering late must first get a *permit*, if a man, of the Dean of Men, if a woman, of the Dean of Women; and, if a former student, must pay a fee of one dollar. Having secured the permit of the Dean of Men or of Women, *a new student* will apply at the Registrar's Office for a study-list; *a former student not in attendance the previous semester* will also apply at the Registrar's Office; *a former student who has been in attendance the previous semester* will find his study-list at the office of his dean or director. (The permits of the Deans of Men and of Women mentioned in this rule are not substitutes for the permits required in the case of *former students not in good standing*. See paragraph 5.)

23. Week Old Study-Lists Invalid

A study-list becomes invalid if not filed at the Business Office within one week after the date of its issue; in this case the student becomes subject to the provisions of paragraph 22.

24. Changes in Study-Lists

Permission to change study-lists after registration may be obtained only from the dean of the college or the director of the school in which the student is enrolled. No changes can be made on the registration days.

Changes in study-lists must be completed and filed at the Business Office not later than 5:00 p. m. of the tenth day of class work as scheduled (Saturday, October 2, 1915) or a fee of \$1.00 will be charged for each change; provided that the total charge for the re-arrangement provided for on any one change slip shall not exceed \$2.00.

25. Listeners or Visitors

(a) *Registered Students.* Permission to attend classes as listeners or visitors is granted to registered students only with the consent of the instructor of the class and with the approval of the dean of the college or the director of the school in which the student is enrolled. *Students who visit a course as listeners are not allowed an examination for credit.*

(b) *Persons in the Employ of the University.* Permission to attend classes regularly as visitors only may be granted, without fee, to persons in the employ of the University on the recommendation of the head of the department in which the employee is at work, with the consent of the instructor in the course, and with the approval of the dean of the college in which the course is given.

(c) *Persons Not Connected with the University.* Permission to attend classes regularly as listeners only may be given to persons who are not connected with the University, on the following conditions: (1) they must first secure the consent of the instructor concerned and of the dean of the college in which the course is given; (2) they must pay a fee of \$7.50 for each course attended.

No instructor is allowed to admit any listeners or visitors to any of his classes except on presentation of a written certificate showing that he has complied with the foregoing conditions.

Visitors' permits should not be applied for on the registration days.

26. Fees Payable in Advance

All fees are payable in advance at registration.

A student who is in debt to the University at the end of any semester shall not be permitted to register in the University again and shall not be entitled to receive an official statement of his credits from the Registrar until his indebtedness has been discharged.

27. Hospital Fund

Information in regard to the Students' Mutual Benefit Hospital Fund may be obtained at the offices of the Dean of Men and the Dean of Women.

28. "Regulations"

Every student should obtain, at the office of his dean, a copy of the "*Regulations for the Guidance of Undergraduate Students*," should look it through, and should keep it for reference.

THE COLLEGE OF LIBERAL ARTS AND SCIENCES

I. DIRECTIONS FOR FRESHMEN

(1) Read paragraphs 1, 2, 10, 13, 14, 15, 20, 21, 22, 27, and 28, pages 9-15.

(2) Obtain your study-list, (1) *if you already have a permit to register*, at the desk on the first floor of University Hall, opposite the main entrance; (2) *if you have not yet secured a permit to register*, at the Registrar's Office, 156 Administration Building.

(3) Follow, *point by point*, the directions on the first coupon of the study-list.

(4) You will find your adviser who is to approve your study-list in one of the following places:

FRESHMEN ADVISERS

Freshmen whose major work is to be in *language, economics* (not business), *education, English, history, philosophy, political science, psychology, or sociology*, in Room 208, University Hall; freshmen in *household science*, (see page 27), in Room 315 University Hall.

Freshmen whose major work is to be in *astronomy, botany, chemistry, entomology, geology, mathematics, physics, physiology* (not medicine), or *zoology*, in Room 418, Natural History Building; freshmen in the *Medical Course*, (see pages 30, 31), in Room 419, Natural History Building; freshmen in *chemistry and chemical engineering* (see pages 30, 32, 34), in Room 420, Natural History Building.

STUDIES FOR FRESHMEN

The total number of hours for which any freshman registers may not be less than fifteen nor more than eighteen, including the required subjects, except by permission of the Assistant Dean, Room 304, University Hall. A student who cannot devote his entire time to his studies because of ill health, outside work necessary to meet expenses (see paragraph 10, page 11), or other good reason, should consult with the Assistant Dean before registering.

1. *Required*.—All men who enter as freshmen must register for *Rhetoric 1 (first semester) and 2 (second semester), *Military 2a* (first semester) and 1 and 2b (second semester), and *Physical Training 1* and 1a (first semester) and 2 (second semester). All women who enter as freshmen must register for *Rhetoric 1 (first semester) and 2 (second semester) and for *Physical Training 7a* and 9 (first semester) and 7b (second semester). Excuse from Military or Physical Training may be secured for good reason *after registration* from the Dean of Men, Room 152, Administration Building, in the case of men, and from the Dean of Women, Room 102, Woman's Building, in the case of women. (*For directions for registering in Military and Physical Training* see paragraphs 20 and 21, pages 13, 14). In addition to the above all freshmen (except those in the Medical Course) must take *foreign language*. Freshmen whose major work is to be in one of the natural sciences and who have not had at

*Except those in the Courses in Chemistry and Chemical Engineering.

least a one-year course in chemistry or physics in an accredited high school, should register for one or both of these subjects during the year.

2. *Elective*.—The subjects listed below are open to freshmen. *Do not register for any others.* Courses should be selected from at least *three of the five groups*, not counting art and design, household science, or library science.

Freshmen are advised not to register for more than one *beginning* course in foreign language at the same time, nor for more than two five-hour laboratory courses.

Students who wish to continue their study of Latin in the University are strongly urged to take Greek also. The Greek and Latin classics are important as a foundation for the serious study of modern literature, history, philosophy, and education. Students who wish to specialize later in history and politics are advised to take History *1a* (first semester) and *1b* (second semester) in their freshman year.

Music.—Courses 1-12 in Music (see the Description of Courses beginning on page 81) may be counted for credit in this College. Others may be taken without credit. Students wishing to enter courses in music must consult the Director of the School of Music, Room 202, University Hall, and secure from him a slip designating the course and the fee. This slip must be presented to the class adviser. The total number of hours including music must not exceed eighteen. Not more than sixteen hours of regular work should be entered upon the registration blank of freshmen who take music.

Law.—Students planning to enter the College of Law after two years of study in this College take the prescribed subjects: Rhetoric, Military, Physical Training, Foreign Language (preferably Latin, if two or three units have been offered for entrance; German, if one or more units of German have been offered for entrance; or French, with or without entrance credit). They are advised to make up the rest of the schedule from among the following subjects: Economics, History, Mathematics (see page 72) for a recommended program; also page 73 for the combined course for the A.B. and LL.B.). *Courses in Law may not be taken by students enrolled in this College before the senior year. Consult advisers in Room 208, University Hall.*

For the description and time-table of each of the courses named below see the Description of Courses, beginning on page 81. The courses are arranged in alphabetical order by departments.

FIRST SEMESTER

- I. English 10¹ (3)²; Rhetoric 1 (3).
- II. French 1a (4) or 2a (4); German 1 (4) or 3 (4) or 4 (4) or 5 (4); Italian 1a (3); Greek 1a (4) or 3 (3); Latin 1a (4) or 2a (4) or 6 (4); Spanish 1a (4) or 2a (3) or 3a (2).
- III. Economics 7 (3) and 26 (3); History 1a (4) or 2a (3).
- IV. Mathematics 2 (3) and 4 (2) [prerequisite: entrance algebra, 1½ units; plane geometry, 1 unit]; chemistry 1³ (5) or 1a³ (3); Physics 7a⁴ and 8a⁴.

¹English 10-11 is open only to freshmen who have presented the minimum amount of English required for admission. See the Description of Courses, pages 81ff.

²The figure immediately following the subject is the number of the course (see page 81); the figure in parenthesis indicates the number of credit hours to be secured in the course each semester.

³May be taken in either semester, but not in both.

⁴Prerequisite: Mathematics 4 (Trigonometry), which may be taken at the same time.

- V. Botany 1^a (5), 4d (3); Entomology 1a (2), 15 (5); Geology 3^a (5), 14 (3); Zoology 1^a (5).
 Household Science 2 (2) or 7a (2).
 Library Science 12^a (2).
 Art and Design 1^a (3).

SECOND SEMESTER

- I. English 11^a (3)²; Rhetoric 2 (3).
 II. French 1b (4) or 2b (4); German 1 (4) or 3 (4) or 4 (4) or 5 (4) or 6 (4) or 7 (4) or 12 (4); Greek 1b (4), 4 (4); Italian 1b (3); Latin 1b (4), or 2b (4); Spanish 1b (4) or 2b (3) or 3b (2).
 III. Economics 22 (3) and 27 (3); History 1b (4) or 2b (3).
 IV. Mathematics 6 (5); Astronomy 4 (5); Chemistry 1^a (5) or 1a^a (3) or 2a (5); Physics 7b^a and 8b^a (5).
 V. Botany 1^a (5), 2b (5), 3b (5), 4 (3), 4a (5), 4c (5), 7b (5); Entomology 1b (2); Geology 1a (5), 3^a (5); Zoology 2 (5), 1^a (5), or 16 (2).
 Household Science 1 (3).
 Library Science 12^a (2).
 Art and Design 1^a (2).

CONDITIONED FRESHMEN

Conditioned freshmen should see paragraph 13, page 11.

II. DIRECTIONS FOR STUDENTS OTHER THAN FRESHMEN IN THE GENERAL COURSE IN LIBERAL ARTS AND SCIENCES

1. Read paragraphs 1-28, pages 9-15.
2. Students in attendance the second semester of 1914-15 and in good standing will obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Students not in college last semester or not in good standing see paragraphs 4 and 5, page 10.
3. Follow, *point by point*, the directions on the first coupon of the study-list.
4. Students who registered for the first time in September, 1913, or later *as freshmen in general courses* (liberal arts or science), *or in household science*, and who are candidates for the A. B. degree, must comply with the *new requirements for graduation* as described on pages 24-26.
5. Former students who have essentially *senior standing in general courses* (liberal arts or science) *or in household science* and who are candidates for the A. B. degree may register in accordance with the old requirements for graduation in their particular course, as described on pages 21-24, or they may proceed under the new requirements stated on pages 24-26.
6. Students who have not completed their *military* and *physical training* requirements must register for these subjects. (See pages 13, 14.)

¹English 10-11 is open only to freshmen who have presented the minimum amount of English required for admission. See the Description of Courses, pages 81ff.

²The figure immediately following the subject is the number of the course (see page 81); the figure in parenthesis indicates the number of credit hours to be secured in the course each semester.

³May be taken in either semester, but not in both.

⁴Prerequisite: Mathematics 4 (Trigonometry), which may be taken at the same time.

7. No student may take less than fifteen hours without special permission of the Assistant Dean, Room 304, University Hall, nor more than eighteen unless his standing in each of the studies of the previous semester was at least 90.

8. A student who cannot devote his entire time to his studies because of ill health or outside work necessary to meet expenses, or for other good reason, should consult with the Assistant Dean before registering.

9. Students should choose their *major subject*, indicating it on the registration blank, not later than at the beginning of the *junior* year. The study-lists of all *juniors* and *seniors* should be made up after consultation with the departments in which the major subject is chosen.

10. For the requirements in the various departments for *majors* and *minors* according to the *new requirements for the A. B. degree* in general courses, see the Description of Courses, beginning on page 81, under the proper subject.

11. *Music*.—For courses in music see the Description of Courses beginning on page 81, under Music. Courses 1 to 12 inclusive may be counted for credit in this College. Others may be taken without credit.

Students wishing to enter courses in Music must consult the Director of the School of Music, Room 202, University Hall, and secure from him a slip designating the course and the fee. This slip must be presented to the class adviser who will then add the course to the student's study-list, provided the total number of hours including music does not exceed eighteen.

12. *Education*.—Students who plan to teach should see the announcement of the School of Education, page 77.

13. *Library Science*.—Students who plan to take a library course after graduation from this college should consult the Recommended Preliminary Course outlined by the Library School, page 75.

14. *Law*.—Courses in law may not be taken by students enrolled in this college before their senior year.

CLASS ADVISERS IN GENERAL COURSES

- (1) Students whose major work is to be in *language, economics* (not business), *education, English, history, philosophy, political science, psychology, or sociology*:
 - (a) Freshmen and sophomores.....Room 208, University Hall
 - (b) JuniorsRoom 302, University Hall
 - (c) Seniors (including all students who plan to graduate in June, 1916).....Room 308, University Hall
- (2) Students whose major work is to be in *astronomy, botany, chemistry* (general), *entomology, geology, mathematics, physics, physiology* (not medicine), or *zoology*:

All classes.....Room 418, Natural History Building
- (3) *Specials*.....Room 315, University Hall

REQUIREMENTS FOR GRADUATION IN GENERAL COURSES

Note

Students who have essentially senior standing (that is, in general, 94 semester hours or more) and who are candidates for the A. B. degree may register either

in accordance with the requirements of the former Colleges of Literature and Arts and Science (now combined), or in accordance with the requirements of the new College of Liberal Arts and Sciences.

Students who registered for the first time in September, 1913, or later, and who are candidates for the A. B. degree must comply with the new requirements.

For the "new requirements" see page 24.

The "old requirements" follow:

"The Old Requirements"

A. *University Requirements*.—Each candidate must meet the general University requirements as to residence and registration. He must also secure credit in approved courses amounting to 130 hours. An hour is one class period a week for one semester, each class period presupposing two hours' preparation by the student, or the equivalent in laboratory or drawing room.

B. *Prescribed Studies*.—Subjects specifically prescribed for all students: *Rhetoric 1-2** (6 hours); *Physical Training 1-2 and 1a for men, 7a-7b and 9 for women; Military Science 1 and 2 for men*. In addition, students who purpose to make a science their major subject, are required to have *Chemistry 1* and *Physics 7a-7b, 8a-8b (or 1a-1b, 3a-3b)* unless they have had one-year courses in these subjects in an accredited high school or acceptable equivalent courses elsewhere.

C. (1) *Group Requirements for the degree according to the schedule of the former College of Literature and Arts*.—Every candidate must offer a minimum of 8 hours in each of the following groups:

I. English, including literature and rhetoric.

II. Ancient and modern languages other than English, including Greek, Latin, the Germanic languages, and the Romance languages. Only courses which require the use of a foreign language may be counted in this group, and the 8 hours offered must all be in the same language.

III. The social sciences, including history, economics, political science, and sociology.

IV. Mathematics and philosophy, including mathematics, education, philosophy, and psychology. A candidate who elects mathematics must take at least five hours of it. If a student does not elect mathematics, his elections in this group must include work in at least two of the other departments of the group; that is, if he does not take mathematics, he must take either philosophy and psychology, or philosophy and education, or education and psychology. With the exception of mathematics, no subject of this group is open to freshmen.

V. The natural sciences, including astronomy, botany, chemistry, entomology, geology, physiology, physics, and zoology. Zoology 16 may not be counted toward this group requirement.

C. (2) *Group Requirements for the degree according to the schedule of the former College of Science*.—Each candidate must offer 8 hours in each of the following Groups: 1, 2, 3, and 5. In Group 4, 16 hours must be offered, provided that students who have had three years of work in foreign language in an accredited high school, or an equivalent course elsewhere, will be relieved from the requirements of Group 4, and similarly those who have had one year

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See paragraph 14, p. 12.

or two years of foreign language may be relieved from 4 hours or 8 hours, respectively, of this requirement. The physics and chemistry of the prescribed list may be applied on the requirements of Groups 1 and 2.

Group 1.—Mathematics, physics, astronomy, logic (Philosophy 1), mineralogy (Geology 5).

Group 2.—Chemistry, geology, household science, bacteriology (Bacteriology 5).

Group 3.—Botany, zoology, physiology, psychology, entomology.

Group 4.—Foreign language.

Group 5.—English literature, history, political science, economics, philosophy, education.

D. (1) *Major Subjects according to the former College of Literature and Arts.*—Each candidate must select some one subject to be designated as his major, and secure credit in that subject to the amount of 24 hours. The courses selected for the last two years should include some distinctly advanced work. The subjects which may be recognized as majors in this college are subject to additions from time to time; at present they are as follows: Classics¹; economics; education; English² (including English literature and rhetoric); French³; German⁴; Greek¹; history; household science; Latin¹; mathematics; philosophy; political science; psychology; sociology.

D. (2) *Major subjects according to the former College of Science.*—A total credit of at least 20 hours must be secured in some one of the divisions of the following major elective list. Not more than 40 hours' work (exclusive of thesis) in any one of these divisions may be applied toward graduation. In arranging the subjects to be counted toward the major requirement the student is advised to consult with the head of the department in which the major is taken.

Major electives are: Astronomy, botany, chemistry, education, entomology, geology (including mineralogy and physical geography), household science, library science, mathematics, physics, physiology, psychology, and zoology.

E. *Elective Subjects.*—The remainder of the course is made up of electives chosen under defined conditions.

1. Credit is regularly given for courses properly announced in the following subjects: Art and design (the total credit in this department is limited to 20 hours); astronomy, botany, chemistry, the classics, economics (including accountancy and commercial law), education, English, entomology, geology, Germanic languages, history, household science, library science, mathematics, philosophy, physics, physiology, political science, psychology, Romance languages, sociology, zoology.

2. Not more than 40 hours in any one subject may be counted for graduation, except when the student is writing a thesis. In this case he may count, in addition to the 40 hours, the hours of the seminar course in which he does his thesis work. In the department of English a student may take 40 hours in addition to Rhetoric 1-2.

3. No credit is granted in any subject unless the student pursues it for the full time required in the shortest course offered in that subject. For example, if the student elects a course which yields two hours of credit for one semester,

¹For the definition of the major in this subject, see the Description of Courses, pages 81ff., under The Classics.

²For the definition of the major in English, see the Description of Courses, pages 81ff., under English.

³A major in French must include 24 hours in addition to French 1a-1b.

⁴A major in German must include 24 hours in addition to German 1 and 3.

he must stay in the class during the semester in order to get any credit at all. In order to secure any credit in a beginning course in a foreign language, a full year's work must be completed.

4. Seniors graduating under the schedule of the former College of Literature and Arts who register in courses open to freshmen may receive only one-half of the credit regularly assigned to such courses. The following courses are included in this list: Art and Design 1 and 2; Astronomy 1; Botany 1, 4d; Chemistry 1; English 1-2, 10-11, 20; Entomology 1a-1b; French 1a-1b; Geology 3, 10, 14, 23; German 1, 3; Greek 1a-1b; History 1a-1b, 2a-2b; Household Science 2, 7a-7b; Latin 1a-1b; Library Science 12; Mathematics 2, 4; Rhetoric 1-2; Spanish 1a-1b; Zoology 1, 16.

5. A limited amount of credit toward the A.B. degree is ordinarily given for courses offered in other colleges and schools of this University. Students who continue under the schedule of the former College of Science may select, with the approval of the Dean, approximately one-third of the work to be counted toward a degree, from subjects given in other colleges of the University. Students who continue under the schedule of the former College of Literature and Arts will ordinarily confine their elections of work in other colleges and schools to the following courses:

Physical Training.—Not to exceed 5 semester hours.

Military Science and Tactics.—Military Science 1 and 2.

Law.—Law 1a-1b (Contracts); Law 2a-2b (Torts); Law 3 (Real Property); Law 4 (Pleading); Law 5 (Criminal Law); Law 6 (Personal Property). The total credit is limited to 24 hours. None of these courses may be taken before the senior year. Law 1a-1b may count for six hours only.

Engineering.—General Engineering Drawing 1 and 2 (Mechanical Drawing and Descriptive Geometry); Theoretical and Applied Mechanics 20 and 21 (Analytical Mechanics); Mechanical Engineering 12 or 11 (Thermodynamics); Civil Engineering 96 or 27 (Surveying); Architecture 31, 32 (Architectural Drawing); Architecture 13, 14, 15, 16 (History of Architecture); Electrical Engineering 4 and 21, or 2 and 26 (Principles).

Agriculture.—Agricultural Extension 1 (Elementary Agriculture for teachers); Agronomy 9 (Soil Physics); Farm Management 1; Agronomy 22 (Plant Breeding); Animal Husbandry 7 (Principles of Animal Nutrition); Animal Husbandry 30 (Genetics); Horticulture 9 (Forestry); Horticulture 10a (Landscape Gardening); Horticulture 12 (Evolution of Horticultural Plants); Horticulture 19 (Amateur Floriculture), for household science students only. The total credit allowed in these agricultural courses will not ordinarily exceed 14 hours.

Library Science.—Library 3a-3b (Selection of Books); Library 7 (History of Libraries); Library 9 (History of Books and Printing); Library 2a-2b or 12 (General Reference); Library 13a-13b (Public Documents). The total credit allowed in Library Science will not ordinarily exceed 14 hours. The course in General Reference (Lib. 12) is of special value to students in the courses in Liberal Arts and Sciences.

Music.—Music 1-2, 3-4, 5-6, 7-8, 9-10, and 11-12 (courses in the history and theory of music).

Courses not listed under paragraphs 1 to 5 above may not be counted for the degree of A.B., except by special permission of the Dean of the College.

F. *Bachelors' Theses*.—A bachelor's thesis is not generally required in this College. Students of high standing are, however, encouraged to write theses in

connection with their major studies. Credit toward the degree is given for thesis work only as a part of the work in some course for which the student is registered. Students desiring to take a thesis course in geology or mineralogy may add to their credits in those subjects the credits received for chemistry; and students in physiology may add to their credits in that subject those in zoology and bacteriology. Only students graduating with a thesis will, as a rule, be selected for fellowships, scholarships, and other similar university honors. Candidates for honors or the honor degree, are required by the general regulations of the University to write a thesis.

"The New Requirements"

(See paragraph 4, page 19)

Requirements for the A.B. Degree.

- A. *Prescribed Subjects.*—Rhetoric 1-2; Physical Training 1-2 and 1a for men; Physical Training 7a-7b and 9 for women; Military Science 1 and 2 for men.
- B. *Group Requirements.*—Every candidate must offer the minimum of work specified in each of the following groups:
 - I. *English.*—The offering in this group must include at least one-semester course in literature.
 - II. *Foreign Languages and Literatures* (exclusive of courses in translation.
 If a student has offered but two units of a foreign language for entrance to the University, he must pursue the study of foreign language through two year courses or the equivalent. If he has offered for entrance three or more units of foreign language, he must continue the study of foreign language through one year of his college course.
Note: Candidates for the degree who have not offered Greek or Latin or French or German for entrance must offer one of these languages for graduation.
 - III. *History, Political and Social Science.*—History, economics, political science, sociology: 8 hours.
 - IV. *Mathematics and Physical Science.*—Mathematics, astronomy (courses with college mathematics as prerequisites), physics, chemistry: 8 hours.
 - V. Botany, entomology, geology, physiology, zoology: 8 hours.
 - VI. Education, philosophy, psychology: 6 hours, of which 3 shall be in philosophy or psychology.
- C. *Major Subjects.*—Each candidate must select some one subject as his major. A major consists of courses amounting to 20 hours chosen from among those designated by a department and approved by the faculty of the college. Such courses are to be exclusive of those elementary or beginning courses which are open to freshmen, and inclusive of some distinctly advanced work.

The subjects at present recognized as majors in this college are: Astronomy, bacteriology, botany, chemistry, classics, education, economics, English, entomology, French, geology, German, Germanic languages, Greek, history, household science, Latin, mathematics, philosophy, physiology, physics, political science, psychology, Romance languages, sociology, zoology.

D. *Minor Subjects.*—Each candidate must offer, in addition to his major, a minor of 20 hours in one or more allied subjects designated by the major department and approved by the faculty of the college. At least 8 hours must be offered in one subject.

E. *Elective Subjects.*—

1. Not more than 40 hours in any one subject may be counted for graduation, except: (a) in special courses approved by the faculty of the college; (b) when a student is writing a thesis, he may count, in addition to the 40 hours, the hours of the course in which he does his thesis work; (c) in the department of English a student may take 40 hours in addition to Rhetoric 1-2.

Note: The total credit in Art and Design is limited to 20 hours.

2. No credit is granted in any subject unless the student pursues it for the full time required in the shortest course offered in that subject. For example, if the student elects a course which yields two hours for one semester, he must stay in the class during one semester in order to get any credit at all. In order to secure any credit in a beginning course in a foreign language, a full year's work must be completed.

3. A limited amount of credit towards the A.B. degree is ordinarily given for courses offered in other colleges and schools of this University, as follows:

Physical Training: Not to exceed 5 semester hours.

Military Science and Tactics: Military Science 1 and 2.

Law: Not to exceed 30 semester hours. (See page 20).

Engineering: General Engineering Drawing 1 and 2 (Mechanical Drawing and Descriptive Geometry); Theoretical and Applied Mechanics 20 and 21 (Analytical Mechanics); Mechanical Engineering 12 and 11 (Thermodynamics); Civil Engineering 96 or 27 (Surveying); Architecture 31, 32 (Architectural Drawing); Architecture 13, 14, 15, 16 (History of Architecture); Electrical Engineering 4 and 64, or 61, 12, 62. The total credit allowed in these engineering courses will not ordinarily exceed 24 hours.

Agriculture: Agricultural Extension 1 (Elementary Agriculture for Teachers); Agronomy 12, Agronomy 25 (Seeds), for business students only; Agronomy 9 (Soil Physics); Farm Management 1; Agronomy 22 (Plant Breeding); Animal Husbandry 7 (Principles of Animal Nutrition); Animal Husbandry 30 (Genetics); Horticulture 9 (Forestry); Horticulture 36 (Landscape Gardening); Horticulture 12 (Evolution of Horticultural Plants); Horticulture 19 (General Floriculture), for household science students only. The total credit allowed in these agricultural courses will not ordinarily exceed 14 hours.

Library Science: Library 7 (History of Libraries); Library 9 (Bookmaking); Library 2a-2b or 12 (General Reference); Library 13a-13b (Public Documents). The course in General Reference (Lib. 12) is of special value to students in the College of Liberal Arts and Sciences.

Music: Music 1-2, 3-4, 5-6, 7-8, 9-10, and 11-12 (courses in the history and theory of music).

Courses not listed under paragraph 3 above may not be counted for the degree of A.B., except by special permission of the Dean of the College.

- F. *Bachelors' Theses*: A bachelor's thesis is not generally required in this College. Students of high standing are, however, encouraged to write theses in connection with their major studies. Credit toward the degree is given for thesis work only as part of the work in some course for which the student is registered. The presentation of a thesis is specifically required of all candidates for the honor degree.

III. DIRECTIONS FOR STUDENTS IN JOURNALISM

Students who are preparing to enter the *advertising* or *managerial* sides of journalistic work should enroll in the College of Commerce and Business Administration. See the directions for registration in that College, page 37.

Students who are preparing for journalistic work on the *reportorial*, *literary*, or *editorial* sides should take their major work in English. They should make up their study schedules from the following suggested course*. With the consent of the adviser, other courses may, for purposes of specialization, be substituted for suggested courses. A program which satisfies the group and major requirements may, for instance, be so modified in the third and fourth years as to lay emphasis on any one of the social sciences.

Students in journalism with major in English are subject to the requirements of the General Course in Liberal Arts and Sciences and should follow the directions for students in the General Course, using the outline below in connection with those directions. The directions for freshmen in the General Course are given on pages 17, 18; those for students other than freshmen on pages 19, 20.

The adviser for students in Journalism (with major in English) will be found in Room 323a University Hall.

Suggested Course in Journalism

(Major in English)

FIRST SEMESTER		FIRST YEAR		SECOND SEMESTER	
<i>Prescribed Subjects</i>		Hours		<i>Prescribed Subjects</i>	Hours
Rhetoric 1.....	3			Rhetoric 2.....	3
Physical training.....	1			Physical training.....	1
Military	1			Military	2
<i>Suggested Electives</i>				<i>Suggested Electives</i>	
Continental European History (Hist. 1a)...	4			History 1b.....	4
Foreign language.....	4			Foreign language.....	4
English 10 or science.....	3 or 5			English 11 or science.....	3
General Reference (Library 12).....	2				
SECOND YEAR					
<i>Prescribed Subjects</i>				<i>Prescribed Subjects</i>	
Military	1			Military	1
<i>Suggested Electives</i>				<i>Suggested Electives</i>	
News Writing (Rhetoric 12).....	2			News Writing (Rhetoric 13).....	2
English 1 or science.....	3 or 4 or 5			Foreign language continued.....	4
History of U. S. (Hist. 3a).....	3			History of U. S. (Hist. 3b).....	3
Foreign language continued.....	4			English 1 or State & Local Gov't. (Pol. Sc. 3) (4 or 3) or Money and Banking (Econ. 3).....	3
Am. Nat'l. Gov't. (Pol. Sc. 1) or Principles of Economics (Econ. 1).....	5			Shakespeare (English 23) or Literature (English 13)	3 or 2
Am. Literature (English 12).....	2				

*For new additional courses in Journalism see the Description of Courses beginning on page 81, under English (Rhetoric).

THIRD YEAR

Intermediate English	3	Intermediate English	3
Municipal Govt. (Pol. Sc. 4).....	3	Science	5
Foreign language continued.....	4	State & Local Govt. (Pol. Sc. 3) or Political Parties (Pol. Sc. 14).....	3 or 2
Logic (Philosophy 1).....	3	Intro. to Philosophy (Phil. 2).....	3
Rhetoric 15 or 6, or Psychology 1.....	3	Foreign language.....	4
Sociology 1.....	3	Rhetoric 16 or 17, or Psychology 1.....	3
		Sociology 1.....	3

FOURTH YEAR

Rhetoric 15 or English 27.....	3	Rhetoric 16 or English 28.....	3
Political Ethics (Phil. 9) or Const. Law (Pol. Sc. 5).....	3	Contemporary politics (Pol. Sc. 18 or 28)	2 or 3
History of U. S. (Hist. 21).....	3	Social & Indust. Legis. (Pol. Sc. 11).....	3
Public Finance, or Corporation Management and Finance, or Labor Problems (Econ. 5 or 10 or 12).....	3	Industrial Consolidation, or Economic History of Europe, or Socialism and Social Reform (Econ. 11 or 13 or 21).....	3

IV. DIRECTIONS FOR STUDENTS IN THE COURSE PRELIMINARY TO LAW

It is recognized by the best authorities on legal education that professional studies in law should be preceded by a thoro course in the humanities and the sciences. As a foundation for the study and practise of law, the following subjects offered by this College are of special importance: English, with special reference to composition and public speaking; Latin and French; logic; constitutional and political history; political science; economics; sociology.

By the proper selection of his studies it is possible for a prospective law student to take both the degree in arts and the degree in law in six years. A student who has senior standing in the College of Liberal Arts and Sciences and who has earned at least 30 hours in this college may take and count toward the A.B. degree law work with hour for hour credit to a maximum of 30 hours. *Students are not permitted to take this work in law until their senior year.* If the student is also a candidate for the degree of LL.B., or J.D., he should in his fourth year register in the College of Law, pay the usual fee of that College, and file a copy of his study-list with the adviser for seniors in this College. A fee of five dollars is charged for every law subject taken by students who do not pay the regular law school fee.

The degree of Bachelor of Arts is conferred at the close of the fourth year of the combined course provided that all the requirements for the degree are met at that time.

Students admitted to this University from other institutions may count the above courses in law for the degree of A.B. only on condition of completing at least 30 hours' work in residence in subjects offered by the College of Liberal Arts and Sciences.

V. DIRECTIONS FOR STUDENTS IN HOUSEHOLD SCIENCE

The courses of instruction given in this department are planned to meet the needs of four classes of students: (a) those students who desire a knowledge of the general principles and facts of household science; (b) those students who wish to make a specialty of household science for the purpose of teaching the subject in secondary schools and colleges; (c) those students who wish some knowledge of the principles underlying household administration and institutional management; (d) those students who are interested in the work of dietitians.

The suggested courses for teachers and for institutional workers are outlined below. The first three years of the course as outlined for teachers give a scientific basis for the work of the dietitian.

Students who hold *scholarships in household science* must make this subject their major along one of the lines indicated above and take each semester at least four hours in household science or in subjects required for admission to courses in household science.

Students who major in household science must also satisfy the requirements of the General Course in the College of Liberal Arts and Sciences in so far as these are not covered in the courses given below, and should follow the directions for students in the General Course, using the outlines below in connection with those directions. The directions for freshmen in the General Course are given on pages 17, 18; those for students other than freshmen on pages 19, 20.

The adviser for students in Household Science will be found in Room 315, University Hall, on the registration days.

Suggested Course for Teachers of Household Science

FIRST YEAR

FIRST SEMESTER

	Hours
Chem. 1—Inorganic Chemistry.....	5
H. Sci. 2—Home Arch. and Sanitation....	2
Rhet. 1—Rhetoric and Themes.....	3
Foreign Language.....	4
P. T. 7—Physical Training.....	1
P. T. 9—Hygiene.....	1

SECOND SEMESTER

	Hours
Chem. 2a—Inorg. Chem. and Qual. Anal..	5
Rhet. 2—Rhetoric and Themes.....	3
*H. Sci. 1—Principles of the Selection and Preparation of Food.....	3
Foreign Language.....	4
P. T. 7—Physical Training.....	1

SECOND YEAR

Chem. 13a—Agricultural Analysis.....	5
H. Sci. 6—Economic Uses of Food.....	3
A. & D. 1—Free Hand Drawing.....	3
Eng. 1—Survey of English Literature....	4
Lib. Sci. 12—General Reference.....	2

Chem. 9—Organic Chemistry.....	3
Chem. 9c—Organic Synthesis.....	2
H. Sci. 7—Textiles.....	2
A. & D. 12—Applied Design.....	2
Eng. 2—Survey of English Literature....	4
Bot. 1—General Botany or	
Zool. 1—General Zoology.....	5

THIRD YEAR

Physiol. 4—Minor Course in Physiology...	5
Econ. 2—Principles of Economics.....	3
Hist. 1a—Continental European Hist. or	
Hist. 3a—History of the U. S.....	4 or 3

Electives

Psychol. 1—Introduction to Psychology...	3
Philos. 1—Logic.....	3

H. Sci. 3—Home Decoration.....	2
H. Sci. 5—Dietetics.....	3
H. Sci. 12—Household Art and Clothing..	3
Bact. 5—Bacteriology.....	5
Hist. 1b—Continental European Hist. or	
Hist. 3b—History of the U. S.....	4 or 3

Electives

H. Sci. 14—Problems in the Preparation and Service of Food.....	3
Psychol. 2—General Psychology.....	3
Philos. 2—Introduction to Philosophy....	3

*Attention is called to the fact that high school physics is a prerequisite for Household Science 1.

FOURTH YEAR

H. Sci. 4—Food and Nutrition..... 5	H. Sci. 11—Teachers' Course..... 3
H. Sci. 13—Hist. of Home Economics.... 2	Educ. 10—Technique of Teaching..... 3
Educ. 1—Introduction to Education..... 4	
<i>Electives</i>	
H. Sci. 18—Lunch Room Management.... 5	H. Sci. 10—Home Management..... 2
Edu. 16—Social Education..... 3	Sociol. 7—Social Problems of the Rural Community 2
Sociol. 1—Principles of Sociology..... 3	H. Sci. 17—Problems in Textiles..... 3
Advanced English	Advanced English
Public Speaking 1—Oral Expression..... 2	Public Speaking 2—Oral Expression..... 2

Suggested Course in Household Administration

FIRST YEAR

FIRST SEMESTER	SECOND SEMESTER
Rhet. 1—Rhetoric and Themes..... 3	Rhet. 2—Rhetoric and Themes..... 3
Chem. 1—Inorganic Chemistry..... 5	Chem. 2a—Inorg. Chem. and Qual. Anal. 5
H. Sci. 2—Home Arch. and Sanitation... 2	*H. Sci. 1—Principles of the Selection and Preparation of Food..... 3
Foreign Language..... 4	Foreign Language..... 4
P. T. 7—Physical Training..... 1	P. T. 7—Physical Training..... 1
P. T. 9—Hygiene..... 1	

SECOND YEAR

A. & D. 1—Free Hand Drawing..... 3	A. & D. 12—Applied Design..... 2
H. Sci. 7—Textiles..... 2	Bot. 1—General Botany or
H. Sci. 6—Economic Uses of Food..... 3	Zool. 1—General Zoology..... 5
Foreign Language or English 1..... 4	Foreign Language or English 2..... 4
<i>Electives</i>	
Chem. 13a—Agricultural Analysis..... 5	Chem. 9—Organic Chemistry..... 3
Hist. 1a—Continental European Hist. or	Chem. 9c—Organic Synthesis..... 2
Hist. 3a—History of the U. S..... 3 or 4	Hist. 1b—Continental European Hist. or
Econ. 26—Economic Resources..... 3	Hist. 3b—History of the U. S.... 3 or 4
Lib. Sci. 12—General Reference..... 2	A. & D. 19—History of the Fine Arts.... 2
A. & D. 19—History of the Fine Arts.... 2	Econ. 22—Economic Hist. of the U. S.... 3

THIRD YEAR

Physiol. 4—Minor Course in Physiology... 5	H. Sci. 5—Dietetics..... 3
Psychol. 1—Introduction to Psychology... 3	H. Sci. 3—Home Decoration..... 2
Econ. 1—Principles of Economics..... 5	H. Sci. 10—Home Management..... 2
<i>Electives</i>	
Sociol. 1—Principles of Sociology..... 3	H. Sci. 12—Household Art and Clothing.. 3
H. Sci. 14—Problems in the Preparation and Service of Food..... 3	Psychol. 2—General Psychology or
Advanced English	Edu. 1—Introduction to Education... 3 or 4
<i>Electives</i>	
	Pol. Sci. 3—State and Local Government.. 3
	Pol. Sci. 16—Government of Illinois..... 2
	Philos. 2—Introduction to Philosophy.... 3
	Bact. 5—Introduction to Bacteriology.... 5

FOURTH YEAR

<i>Suggested Electives</i>	<i>Suggested Electives</i>
H. Sci. 13—History of Home Economics.. 2	H. Sci. 11—Teachers' Course..... 3
H. Sci. 15—Economics of the Family Group 3	H. Sci. 17—Problems in the Study of Textiles 3
H. Sci. 18—Lunch Room Management... 5	H. Sci. 9—Seminar..... 3
Bact. 5—Introduction to Bacteriology.... 5	Edu. 10—Observation and Technique.... 3
Edu. 1—Introduction to Education..... 4	Advanced English
H. Sci. 4—Food and Nutrition..... 5	
Advanced English	

* Attention is called to the fact that high school physics is a prerequisite for Household Science I.

VI. DIRECTIONS FOR STUDENTS IN SCIENCE COURSES

(Medicine; Chemistry, Chemical Engineering)

1. Look over the General Directions contained in paragraphs 1-28, page 9-15.
2. Freshmen who have already secured permits to register, and all other students who were in attendance the second semester of 1914-15 and are in good standing will obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Freshmen without permits, see paragraph 1, page 9. Other students not in attendance last semester or not in good standing, see paragraphs 4 and 5, page 10.
3. Report for registration to the third floor of the Natural History Building, south end. You will find your adviser in one of the following rooms, according to the course in which you are enrolling:
COURSE PREPARATORY TO MEDICINE—Room 419, Natural History Building.
COURSES IN CHEMISTRY AND CHEMICAL ENGINEERING—Room 420, Natural History Building.
4. Follow, *point by point*, the directions on the first coupon of your study-list.
5. The outlines of the several courses follow.

Six-Year and Seven-Year Medical Courses

(Leading to the Degrees of Bachelor of Arts and Doctor of Medicine and Surgery)

The University offers a six-year and a seven-year medical course. The six-year course includes three years given at Urbana and three years in the College of Medicine in Chicago; the seven-year course includes four years at Urbana and three years in Chicago. The work given at Urbana includes substantially, in both courses, the work of the first year of a standard course in medicine, together with two years or three years in liberal arts and sciences. Students who have completed the work of the first two years and are taking the work of the third year are registered for that year as medical students in the University of Illinois College of Medicine.

A student who has completed the course outlined below and who then completes a year's work in medicine in a recognized medical school may receive credit by transfer for this year of medical work, and thus receive the degree of Bachelor of Arts from the University of Illinois. Under this plan the student may obtain the degrees of Bachelor of Arts and Doctor of Medicine with six years' or seven years' work.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
General Chemistry (Chem. 1).....	5	Descrip. Inorg. Chemistry and.....	5
Rhetoric (Rhet. 1).....	3	Qualitative Analysis (Chem. 2a).....	5
Trigonometry (Math. 4).....	2	Rhetoric 2.....	3
Zoology 1.....	5	Zoology 2.....	5
Military (Mil. 2a).....	1	Military (1, 2b).....	2
Physical Training.....	1	Physical Training.....	1
Total	17	Total	16

SECOND YEAR

German 1 or 4 ¹ , or Latin.....	4	German 3 or 5 or 6 ¹ , or Latin.....	4
Zoology 3.....	3	Zoology 6.....	3
Quantitative Analysis (Chem. 5a).....	5	Organic Chemistry (Chem. 9, 9c).....	5
Physics 7a, 8a.....	4	Physics 7b, 8b.....	4
Military 2c.....	1	Military 2d.....	1
Total	17	Total	17

THIRD YEAR

German 4 ¹	4	German 5 or 6 ¹	4
Histology (Physiology 1).....	5	Physiology 2.....	7
Physiological Chemistry (Chem. 15).....	7	Physiology 6.....	3
Psychology 1.....	3	Medical Bacteriology (Bacteriology 26).....	5
Total	19	Total	19

FOURTH YEAR

No group requirements are *prescribed* for students who have completed the three years' course and desire to remain at the University the fourth year. Selection from the following courses is recommended: Bacteriology; Chemistry 5b, 5c, 9a, 9b, 14a-14b, 21, 22, 31, 105, and 106; Entomology 2, 3; Physiology 5a-5b; Psychology 113; Zoology 7, 8a-8b, 13, 14a-14b; modern languages; and studies included in Groups 1, 3 and 6 of the general course. Upon the completion of this fourth year, the student takes his baccalaureate degree before going to the college of medicine.

Four-Year Medical Course, First Year

(In Course leading to the Degrees of Bachelor of Science and Doctor of Medicine and Surgery)

The requirement for admission to the four-year medical course (whether the first year of the course is taken at Urbana or in the College of Medicine in Chicago) is as follows: 60 semester hours of college work, including 8 in chemistry, 8 in physics, 8 in biology, 6 in French or German, and 30 elective.

The work in bacteriology, physiology, neurology, histology, and physiological chemistry outlined below covers one-fourth of the requirement for the degree of Doctor of Medicine. Students who are taking the first-year medical course at Urbana are registered for that year as students of the College of Medicine of the University of Illinois.

A student who has completed this first-year medical course and then completes his second year's work in the College of Medicine of the University of Illinois receives the degree of Bachelor of Science; upon the completion of the work of the two remaining years in the College of Medicine he receives the degree of Doctor of Medicine and Surgery.

FIRST SEMESTER

	Hours
Physiology 4.....	5
Histology	3
Physiological Chemistry	7
Neurology	3
Total	18

SECOND SEMESTER

	Hours
Bacteriology 5, 5a.....	8
Physiology 2.....	5
Histology	5
Total	18

¹If Latin has not been offered for entrance.

Course in Chemistry

A student may follow the General Course in the College of Liberal Arts and Sciences with chemistry as a major subject. To do this, follow the directions given, for freshmen on pages 17, 18; for students other than freshmen on pages 19, 20. Such a course leads to the degree of Bachelor of Arts.

For the more specialized training of the chemist the following course, largely prescribed, has been arranged. It leads to the degree of Bachelor of Science in chemistry.

Preliminary preparation in German or French equivalent to two years of high school work or one year of university work is prescribed. The total language requirement for graduation in the chemistry course, including courses offered for entrance, must be equivalent to two years of university German and one year of university French.

Students having one year of high-school chemistry should register in Chemistry 1a. Students not having such preliminary work in high school should register in chemistry 1 (5 hours) and arrange the other subjects in consultation with their adviser.

In the following schedule of courses, after the second year, there are offered certain *prescribed subjects* required of all students and in addition five *group options*, the last four of which are outlined for the purpose of affording systematic training along certain important lines of applied chemistry. The first option, A, is intended for those students who wish to place chief emphasis upon the fundamental branches of chemistry as a science and for those students who desire a combination of subjects not outlined in the other four groups. Students in option A must submit to their adviser at the beginning of the junior year an outline of their proposed course of study for the junior and senior years. Approval of such an outline must be secured from the adviser before registering. At least 12 hours of the electives under option A must be in chemistry and it is recommended that they be selected as far as possible from more advanced courses in inorganic, analytical, organic, and physical chemistry. In all groups, except B, 10 hours of the electives must be taken outside of the department and must include a course in economics.

The groups provided for, with the letter used to designate each group, are as follows:

- A. General
- B. Electrochemical
- C. Industrial
- D. Food and Sanitation
- E. Physiological

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1 or 1a—Inorganic Chemistry—5 or 3		Chem. 3a—Inorganic Chemistry and Qualitative Analysis.....	6
Math. 2—College Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Plane Trigonometry.....	2	German or French.....	4
German or French.....	4	Mil. 2b—Military Drill.....	1
Rhet. 1—Rhetoric and Themes.....	3	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	P. T. 2—Gymnasium.....	1
P. T. 1—Gymnasium.....	1		
Total	17	Total	18

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 5b—Advanced Analytical Chemistry. 5	
French or German.....	4	French or German.....	4
Rhet. 2—Rhetoric and Themes.....	3	Phys. 1b and 3b—General Physics and Physical Measurements.....	4
Phys. 1a and 3a—General Physics and Physical Measurements.....	5	History 2 or 3 or English 20.....	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Total	18	Total	17

THIRD YEAR

Prescribed for all Groups

Chem. 14a—Organic Chemistry.....	4
Chem. 9a—Organic Synthesis and Ulti- mate Analysis.....	2
Chem. 92a—Journal Meeting.....	1
Math. 8a—Differential and Integral Cal- culus	5
Total	12

Group Options

A.—General	
Electives	5
B.—Electrochemical	
Economics 1; or Economics 2 with 3 additional hours other than Chemistry	5
C.—Industrial	
Chem. 65—Technical Gas and Fuel Analysis	2
Elective	2—4
D.—and E.—Food and Physiological Bot. 5—Introductory Bacteriology.	5

*Students electing Option B must reg-
ister in Math. 7.

Prescribed for all Groups

Chem. 14b—Principles of Organic Chem- istry	2
Chem. 9b—Organic Synthesis and Qualita- tive Analysis.....	2
Chem. 31—Principles of Physical Chem- istry	4
Chem. 33—Physical Chemistry Laboratory. 2	
Chem. 92b—Journal Meeting.....	1
Total	11

Group Options

A.—General	
Electives	5
B.—Electrochemical	
Math. 9.....	3
E. E. 8—Electric Currents and Apparatus	3
E. E. 68—Electrical Engineering Laboratory	1—7
C.—Industrial	
E. E. 8—Electric Currents and Apparatus	3
E. E. 68—Electrical Engineering Laboratory	1
Elective	2—6
One inspection trip	
D.—and E.—Food and Physiological Chem. 15—Physiological Chemis- try	5
Elective	2—7

FOURTH YEAR

Prescribed for all Groups

Chem. 95 —History of Chemistry.....	2
Chem. 11 —Research	3
Chem. 93a—Journal Meeting.....	1
Total	6

Prescribed for all Groups

Chem. 11 —Research	7
Chem. 93b—Journal Meeting.....	1
Chem. 6 —Chemical Technology.....	3
Total	11

Group Options

A.—General	
Electives	11
B.—Electrochemical	
Chem. 35—Electrochemistry	3
Chem. 37—Experimental Problems in Physical and Electrochemistry	4
Phys. 4a.—Electrical and Magnetic Measurements	2
Electives	2—11
C.—Industrial	
Chem. 35—Electrochemistry	3
Chem. 7—Metallurgy	3
Chem. 69—Metallurgical Labora- tory and Assaying.....	2
Electives	3—11
D.—Food and Sanitation	
Chem. 5c—Food Analysis.....	5
Chem. 21—Qualitative Organic Analysis	2
Electives	3—10
E.—Physiological	
Chem. 15a or Chem. 22.....	5
Electives	5—10

Group Options

A.—General	
Electives	5
B.—Electrochemical	
Philos. 1—Logic.....	3
Electives	2— 5
C.—Industrial	
Chem. 61—Industrial Laboratory..	3
Electives	3— 6
One inspection trip	
D. and E.—Food and Physiological	
Electives	5

Course in Chemical Engineering

The work of the technical chemist or superintendent is frequently so closely associated with mechanical and other engineering lines as to make a knowledge of these subjects essential. To meet these conditions, the following four-year course in chemistry and related engineering subjects has been arranged. The degree given is that of Bachelor of Science in chemical engineering.

Preliminary preparation in German equivalent to two years of high school or one year of university work is *prescribed*. It is also advised that students intending to take this course be prepared to offer mechanical drawing for entrance or arrange to take General Engineering Drawing 1 or S1.

Students having one year of high-school chemistry should register in Chemistry 1a. Students not having such preliminary work in high school should register in Chemistry 1 (5 hours) and arrange the other subjects in consultation with their adviser.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1a or 1—Inorganic Chemistry..	3 or 5	Chem. 3a—Inorganic Chemistry and Quali- tative Analysis.....	6
Math. 2—College Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Plane Trigonometry.....	2	German 6—Scientific German.....	4
German 4—Prose Reading.....	4	Mil. 2b—Military Drill.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Total	14 or 16	Total	18

SECOND YEAR

Math. 8—Differential and Integral Cal- culus	5	Chem. 5b—Advanced Analytical Chemistrv. 5	
Chem. 5a—Quantitative Analysis.....	5	Rhet. 2—Rhetoric and Themes.....	3
Phys. 1a and 3a—General Physics and		T. and A. M. 20—Analytical Mechanics...	3
		Phys. 1b and 3b—General Physics and	

Physical Measurements.....	5
Mil. 2c—Military Drill.....	1
Rhet. 1—Rhetoric and Themes.....	3
Total	19

Physical Measurements.....	4
Mil. 2d—Military Drill.....	1
Total	16

THIRD YEAR

Chem. 9a—Organic Synthesis and Ultimate Analysis.....	2
Chem. 14a—Organic Chemistry.....	4
Chem. 92a—Journal Meeting.....	1
T. and A. M. 21—Analytical Mechanics..	2
T. and A. M. 25—Resistance of Materials.	4
M. E. 75—Forge Work.....	1
M. E. 77—Foundry Work.....	2
Total	16

Chem. 9b—Organic Synthesis and Qualitative Organic Analysis.....	2
Chem. 14b—Organic Chemistry.....	2
Chem. 31 —Physical Chemistry.....	4
Chem. 33 —Physical Chemistry Laboratory.	2
Chem. 92b—Journal Meeting.....	1
E. E. 8—Electric Currents and Apparatus.	3
E. E. 68—Electrical Engineering Laboratory	1
Electives outside of the department.....	3
One inspection trip	—
Total	18

FOURTH YEAR

Chem. 65—Technical Gas and Fuel Analysis	2
Chem. 7—General Metallurgy and Iron and Steel.....	3
Chem. 69 —Assaying	2
Chem. 93a—Journal Meeting.....	1
Chem. 11a—Research	3
M. E. 1—Steam and Air Machinery.....	3
Chem. 35—Electrochemistry.....	3
Total	17

Chem. 6 —Chemical Technology.....	3
Chem. 61 —Industrial Chemical Laboratory	3
Chem. 11b—Research	6
Chem. 93b—Journal Meeting.....	1
M. E. 64—Mechanical Engineering Laboratory	3
One inspection trip	—
Total	16

VII. SUMMARY OF CLASS ADVISERS

Approval of the course of study selected must be secured from the class adviser in the room and building indicated below:

- Students whose major work is to be in *language, economics* (not business), *education, English, history, philosophy, political science, psychology, or sociology*:
 - Freshmen and sophomores.....Room 208, University Hall
 - Juniors
 - Seniors (including all students who plan to graduate next June)
 - Specials
- Students whose major work is to be in *astronomy, botany, chemistry* (general), *entomology, geology, mathematics, physics, physiology* (not medicine), or *zoology*:
 - All classes, except specials.....Room 418 Nat. Hist. Bldg.
 - Specials
- Household Science*
- Medicine*
- Chemistry and Chemical Engineering*....

Advisers to whom students are to go during the year for advice and assistance will be announced upon the bulletin boards or by mail shortly after registration.

VIII. HEADQUARTERS OF DEPARTMENTS

The headquarters of the different departments, where the heads or their representatives may be consulted during the registration period, are as follows:

U. H.=University Hall; N. H.=Natural History Hall; L. H.=Lincoln Hall; Com.=Commerce Building; P. L.=Physical Laboratory; Chem.=Chemistry Building.

Art and Design.....	Room 405	U. H.
Astronomy	Room 421	N. H.
Botany	Room 209	N. H.
Chemistry	Room 102	Chem.
Comparative Philology	Room 313	U. H.
Economics	Room 103	Com.
Education	Room 203	U. H.
English	Room 323	U. H.
Entomology	Room 223	N. H.
French	Room 309	U. H.
Geology	Room 244	N. H.
German	Room 313	U. H.
Greek	Room 126	L. H.
History	Room 414	U. H.
Household Science.....	Room 315	U. H.
Italian	Room 309	U. H.
Journalism (English)	Room 323	U. H.
Latin	Room 126	L. H.
Mathematics, <i>freshmen</i>	Room 437	N. H.
Mathematics, <i>sophomores</i>	Room 430	N. H.
Philosophy	Room 119	L. H.
Physics	Room 203	P. L.
Physiology	Room 419	N. H.
Political Science.....	Room 414	U. H.
Psychology	Room 210	U. H.
Rhetoric	Room 323	U. H.
Scandinavian	Room 209	L. H.
Sociology	Room 318	L. H.
Spanish	Room 309	U. H.
Zoology	Room 301	N. H.

THE COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION

DIRECTIONS FOR REGISTRATION

1. Business students should read the headings of the paragraphs numbered 1-28 of the General Directions on pages 9-15 and follow those which apply to them.

2. Former business students who were in attendance the second semester of 1914-15 and are in good standing will obtain their study-lists at the table in the lobby on the first floor of the Commerce Building.

3. Freshmen who have planned to register in Commerce and Business Administration but who have received permits to register reading "LAS" will obtain their study-lists at the desk on the first floor of University Hall, opposite the main entrance, and report to the Commerce Building for registration.

4. Freshmen who have received permits to register reading "LAS (Com)" will obtain their study-lists at the table in the lobby on the first floor of the Commerce Building.

5. Freshmen who have not received a permit to register should report at the Registrar's Office, 156 Administration Building.

6. Students not in attendance last semester, not in good standing, transferring from other colleges within the University, etc., should follow the general directions referred to above in paragraph 1.

7. Having secured his study-list the student should follow, *point by point*, the directions on the first coupon. The *Registration Officers* for Business Students will be found in the following places:

Freshmen in Room 303, Commerce Building

Sophomores in Room 202, Commerce Building

Juniors in north end of Room 208, Commerce Building

Seniors in south end of Room 208, Commerce Building

Specials in Room 103, Commerce Building

8. Each student must secure the approval of his Registration Officer for the studies he has chosen. *This approval must be stamped on the study-list.* Each student must then report to the Chapel, 218 University Hall, for the purpose of securing approval of sections in sectional courses, making out class cards, and paying fees.

REQUIREMENTS FOR GRADUATION

1. THE NEW REQUIREMENTS—DEGREE OF BACHELOR OF SCIENCE

Students entering the College of Commerce and Business Administration with the class of 1919 and subsequent classes will be given the degree of Bachelor of Science.

The requirements for the degree are as follows:

1. A candidate must comply with the University requirements as to residence and registration and secure credit amounting to 130 hours, including the general University requirements of *Rhetoric 1 and 2, 6 hours; and Physical Training 1, 1a, and 2, 2 hours*, for men, and *7a-7b and 9, 3 hours*, for women; and *Military Science 1 and 2a-2b, 5 hours*, for men.
2. A candidate must secure credit in the subjects listed as *prescribed* in his chosen course.
3. Of the electives allowed 8 hours must be in either English literature or foreign language in all courses except the Course in Foreign Commerce and the Course for Commercial Teachers, in which foreign language is prescribed.
4. In the General Business Course, the Course in Banking, the Course in Insurance, the Course in Accountancy, the General Course in Railway Administration, and the Course for Commercial and Civic secretaries, 12 hours must be elected in the following group of subjects: history, political science, philosophy, psychology, and sociology, provided that not less than six hours in any one subject may be counted in fulfilling the requirement.
5. In all courses in which less than 10 hours of mathematics is prescribed in the first year, 10 hours must be elected in the following group of subjects: chemistry, geology, mathematics, and physics, provided that not less than 5 hours in any one subject may be counted in fulfilling the requirement.

NOTE.—It should be carefully observed that only the first year in the outlines of courses on succeeding pages applies to, and is valid for, the Class of 1919. Complete outlines of the courses for the Class of 1919 and subsequent classes will be published in a bulletin describing the work of the College of Commerce and Business Administration to be issued soon and in the next *Annual Register* of the University. *Freshmen should give careful attention to provisions 3, 4 and 5 of the requirements above stated. It is advisable that the electives there mentioned be taken as early as possible in the course in order to leave more opportunity for free electives in the last years.*

II. THE OLD REQUIREMENTS—DEGREE OF BACHELOR OF ARTS

The graduation requirements for former students in the Courses in Business Administration will remain as they have been in the past and such students will be given the degree of Bachelor of Arts.

The requirements are as follows:

1. Credit amounting to 130 hours, including the prescribed Rhetoric, Physical Training, and Military.
2. At least 8 hours in each of the following groups of subjects:
 - I. English language and literature, including rhetoric.
 - II. Latin, Greek, French, German, Italian, Spanish.
 - III. History, economics, sociology, and political science.
 - IV. Mathematics, education, philosophy, and psychology.
 - V. Astronomy, botany, chemistry, entomology, geology, physiology, physics, and zoology.

3. Credit in the following subjects:

- I. Six hours of freshman economics (Economics 7, 22, 26, and 27). In case of students transferring from other colleges with advanced standing this requirement may be modified to suit individual needs.
 - II. Principles of Economics (Economics 1).
 - III. Business Writing (Rhetoric 10), Senior Conference on Written Work (Rhetoric 25-26).
 - IV. Principles of Accounting (Accountancy 1a-1b).
 - V. Commercial Law (Business Law 1a-1b).
4. A major of 24 hours in economics, but not more than six hours of freshman economics (Economics 7, 22, 26, and 27) may be counted towards the major. Courses in accountancy and business law may not be counted towards the major.

NOTE.—The outlines of courses on the following pages must be used in connection with the foregoing statement of requirements and attention given to the additional subjects prescribed in different courses.

THE COURSES OF STUDY

The courses of study in commerce and business administration are now in process of transition as a result of the reorganization of the former *Courses in Business Administration* as *The College of Commerce and Business Administration*. The outlines which follow show, therefore, the work of each year as the courses will be taught during 1915-16. They do not show either the new or the old curriculum as a whole. Freshmen will take the first year as scheduled, and regular sophomores, juniors, and seniors, the second, third, and fourth years, respectively; but freshmen must not use the outlines in planning their work for future years. In cases where it is necessary to consider future plans students should consult the Dean of the College. A bulletin describing the new curriculum in detail will be issued soon.

General Business Course as Taught in 1915-16

The subjects listed for the first year are prescribed for students of the class of 1919. An option is allowed between Economics 26 and 7 the first semester, and between Economics 22 and 27 the second semester. In addition to prescribed subjects students must take sufficient electives to make a minimum of 15 hours, but not to exceed a maximum of 18 hours, of work each semester.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
 Econ. 26—Economic Resources or
 Econ. 7—English Economic History
 Rhet. 1—Rhetoric and Themes
 Military
 Physical training
 Electives

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
 Econ. 22—Economic History of United States
 or
 Econ. 27—Modern Industries
 Rhet. 2—Rhetoric and Themes
 Military
 Physical training
 Electives

Commerce and Business Administration

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
 Pol. Sci. 1—American Government
 Hist. 3a—History of United States or
 Hist. 2a—English History or
 Hist. 1a—European History
 Military

Suggested Electives

Foreign language continued
 Mathematics
 Science
 Phil. 1—Logic

Prescribed Subjects

Econ. 3—Money and Banking
 Rhet. 10—Business Writing
 Pol. Sci. 3—State and Local Government
 Hist. 3b—History of United States or
 Hist. 2b—English History or
 Hist. 1b—European History
 Military

Suggested Electives

Foreign language continued
 Mathematics
 Science
 Phil. 1—Logic

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Acc'y 1a—Principles of Accounting
 Econ. 28—Domestic Commerce
 Econ. 10—Corporation Management

Suggested Electives

History
 Econ. 5—Public Finance
 Trans. 1—Transportation System
 Bus. Org. and Op. 1—Business Organization
 and Operation
 Psych. 1—Psychology
 Rhet. 22—Summarizing and Abstracting

Prescribed Subjects

Acc'y 1b—Principles of Accounting
 Econ. 29—Foreign Commerce or
 Econ. 31—Organization of Foreign Commerce
 Bus. Org. and Op. 2—Organization and Control
 of Mercantile Distribution
 Trans. 12—Freight Shipment

Suggested Electives

History
 Econ. 11—Industrial Consolidations
 Trans. 2—Transportation Policy
 Psych. 2—Psychology

FOURTH YEAR FOR THE CLASS OF 1916

Prescribed Subjects

Rhet. 25—Conference on Written Work
 Bus. Law 1a—Commercial Law
 Econ. 37—Salesmanship

Suggested Electives

Acc'y 2a—Advanced Accounting and Auditing
 Bus. Org. and Op. 3—Business Procedure
 Econ. 12a—Labor Problems
 Phil. 9—Political Ethics
 Econ. 4—Financial History of United States

Prescribed Subjects

Rhet. 26—Conference on Written Work
 Bus. Law 1b—Commercial Law
 Econ. 38—Advertising

Suggested Electives

Acc'y 2b—Advanced Accounting and Auditing
 Bus. Org. and Op. 4—Industrial Organization
 and Management
 Econ. 12b—Labor Problems
 Econ. 13—Economic Development of Europe
 Bus. Org. and Op. 9—Commercial and Civic
 Organizations

Course for Commercial and Civic Secretaries as Taught in 1915-16

The subjects listed for the first year are prescribed for students of the class of 1919. An option is allowed between Economics 26 and 7 the first semester, and between Economics 22 and 27 the second semester. In addition to prescribed subjects students must take sufficient electives to make a minimum of 15 hours, but not to exceed a maximum of 18 hours, of work each semester.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
 Econ. 26—Economic Resources or
 Econ. 7—English Economic History
 Rhet. 1—Rhetoric and Themes
 Military
 Physical training
 Electives

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
 Econ. 22—Economic History of United
 States or
 Econ. 27—Modern Industries
 Rhet. 2—Rhetoric and Themes
 Military
 Physical training
 Electives

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
 Pol. Sci. 1—American Government
 Hist. 3a—History of United States or
 Hist. 2a—English History or
 Hist. 1a—European History
 Military

Suggested Electives

Foreign language continued
 Mathematics
 Science
 Phil. 1—Logic

Prescribed Subjects

Econ. 3—Money and Banking
 Rhet. 10—Business Writing
 Pol. Sci. 3—State and Local Government
 Hist. 3b—History of United States or
 Hist. 2b—English History or
 Hist. 1b—European History
 Military

Suggested Electives

Foreign language continued
 Mathematics
 Science
 Phil. 1—Logic

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Acc'y 1a—Principles of Accounting
 Econ. 28—Domestic Commerce
 Pol. Sci. 4—Municipal Government
 Econ. 10—Corporation Management

Suggested Electives

Bus. Org. and Op. 1—Business Organization
 and Operation
 Rhet. 22—Summarizing and Abstracting
 Sociology 1—Principles of Sociology
 Pol. Sci. 13—State Administration
 Phil. 9—Political Ethics

Prescribed Subjects

Acc'y 1b—Principles of Accounting
 Econ. 31—Organization of Foreign Com-
 merce or
 Econ. 29—Foreign Commerce
 Bus. Org. and Op. 2—Organization and Con-
 trol of Mercantile Distribution
 Sociology 8—Charities

Suggested Electives

Econ. 11—Industrial Consolidations
 Pol. Sci. 12—National Administration
 Pol. Sci. 16—Government of Illinois
 Econ. 34—Property Insurance

FOURTH YEAR FOR THE CLASS OF 1916

Prescribed Subjects

Bus. Law 1a—Commercial Law
 Bus. Org. and Op. 3—Business Procedure
 Rhet. 25—Conference on Written Work
 Econ. 37—Salesmanship

Suggested Electives

Econ. 12—Labor Problems
 Sociology 10—Population
 Trans. 1—Transportation System
 Econ. 51—Public Utilities

Prescribed Subjects

Bus. Law 1b—Commercial Law
 Bus. Org. and Op. 4—Industrial Organization
 and Management
 Bus. Org. and Op. 9—Commercial and Civic
 Organizations
 Trans. 12—Freight Shipment
 Rhet. 26—Conference on Written Work
 Econ. 38—Advertising

Suggested Electives

Econ. 21—Socialism and Economic Reform
 Econ. 12—Labor Problems
 Sociology 9—Criminology

Course in Banking as Taught in 1915-16

The subjects listed for the first year are prescribed for students of the class of 1919. An option is allowed between Economics 26 and 7 the first semester, and between Economics 22 and 27 the second semester. In addition to prescribe subjects students must take sufficient electives to make a minimum of 15 hours, but not to exceed a maximum of 18 hours, of work each semester. Banking students must elect Advanced Algebra (Math. 2) in either the first or second year as a prerequisite for the Mathematics of Investment (Math. 23) in the third year.

Commerce and Business Administration

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
 Econ. 26—Economic Resources or
 Econ. 7—English Economic History
 Rhet. 1—Rhetoric and Themes
 Military
 Physical Training
 Electives

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
 Econ. 22—Economic History of United
 States or
 Econ. 27—Modern Industries
 Rhet. 2—Rhetoric and Themes
 Military
 Physical Training
 Electives

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
 Pol. Sci. 1—American Government
 Hist. 3a—History of United States or
 Hist. 2a—English History or
 Hist. 1a—European History
 Military

Suggested Electives

Foreign language continued
 Science
 Phil. 1—Logic.

Prescribed Subjects

Econ. 3—Money and Banking
 Rhet. 10—Business Writing
 Pol. Sci. 3—State and Local Government
 Hist. 3b—History of United States or
 Hist. 2b—English History or
 Hist. 1b—European History
 Military

Suggested Electives

Foreign language continued
 Science
 Phil. 1—Logic

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Acc'y 1a—Principles of Accounting
 Econ. 5—Public Finance
 Econ. 10—Corporation Management

Suggested Electives

Econ. 28—Domestic Commerce
 Bus. Org. and Op. 1—Business Organization
 and Operation
 History

Prescribed Subjects

Acc'y 1b—Principles of Accounting
 Math. 23—Mathematics of Investment
 Bus. Org. and Op. 2—Organization and Control
 of Mercantile Distribution

Suggested Electives

Econ. 29—Foreign Commerce or
 Econ. 11—Industrial Consolidations
 Econ. 31—Organization of Foreign Commerce
 History

FOURTH YEAR FOR THE CLASS OF 1916

Econ. 9—Practical Banking
 Econ. 4—Financial History of United States
 Bus. Law 1a—Commercial Law
 Rhet. 25—Conference on Written Work

Suggested Electives

Econ. 12—Labor Problems
 Acc'y 2a—Advanced Accounting and Auditing
 Phil. 9—Political Ethics
 Econ. 33—Economics of Insurance
 Bus. Org. and Op. 3—Business Procedure

Suggested Electives

Econ. 12—Labor Problems
 Acc'y 2b—Advanced Accounting and Auditing
 Econ. 34—Property Insurance
 Bus. Org. and Op. 4—Industrial Organization
 and Management

Course in Insurance as Taught in 1915-16

The subjects listed for the first year are prescribed for the class of 1919. An option is allowed between Economics 26 and 7 the first semester, and between Economics 22 and 27 the second semester.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
 Econ. 26—Economic Resources or
 Econ. 7—English Economic History
 Rhet. 1—Rhetoric and Themes

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
 Econ. 22—Economic History of United
 States or
 Econ. 27—Modern Industries

Math. 2—Advanced Algebra
Math. 4—Trigonometry
Military
Physical Training

Rhet. 2—Rhetoric and Themes
Math. 6—Analytic Geometry
Military
Physical Training

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
Math. 8—Calculus
Pol. Sci. 1—American Government
Science
Military

Prescribed Subjects

Econ. 3—Money and Banking
Rhet. 10—Business Writing
Math. 23—Mathematics of Investment
Pol. Sci. 3—State and Local Government
Science
Military

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Acc'y 1a—Principles of Accounting
Econ. 10—Corporation Management
Math. 31—Actuarial Theory

Prescribed Subjects

Acc'y 1b—Principles of Accounting
Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution

Suggested Electives

Foreign language continued
Hist. 3a—History of United States
Hist. 1a—European History
Econ. 5—Public Finance
Bus. Org. and Op. 1—Business Organization and Operation
Rhet. 22—Summarizing and Abstracting

Suggested Electives

Foreign language continued
Hist. 3b—History of United States
Hist. 1b—European History
Phil. 1—Logic

FOURTH YEAR FOR THE CLASS OF 1916

Prescribed Subjects

Econ. 33—Economics of Insurance
Bus. Law 1a—Commercial Law
Rhet. 25—Conference on Written Work

Prescribed Subjects

Econ. 34—Property Insurance
Bus. Law 1b—Commercial Law
Rhet. 26—Conference on Written Work

Suggested Electives

Econ. 4—Financial History of United States
Phil. 9—Political Ethics
Econ. 12—Labor Problems
Econ. 9—Practical Banking
Econ. 37—Salesmanship
Bus. Org. and Op. 3—Business Procedure

Suggested Electives

Econ. 12—Labor Problems
Econ. 8—Money Market
Econ. 38—Advertising
Bus. Org. and Op. 4—Industrial Organization and Management

Course in Accountancy as Taught in 1915-16

The subjects listed for the first year are prescribed for the students of the class of 1919. An option is allowed between Economics 26 and 7 the first semester, and between Economics 22 and 27 the second semester. In addition to prescribed subjects students must take sufficient electives to make a minimum of 15 hours, but not to exceed a maximum of 18 hours, of work each semester. Accountancy students must elect Advanced Algebra (Math. 2) in either the first or second year as a prerequisite for Mathematics of Investment (Math. 23) in the third year.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
Econ. 26—Economic Resources or
Econ. 7—English Economic History
Rhet. 1—Rhetoric and Themes
Military
Physical Training
Electives

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
Econ. 22—Economic History of United States
or
Econ. 27—Modern Industries
Rhet. 2—Rhetoric and Themes
Military
Physical Training
Electives

Commerce and Business Administration

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
Acc'y 1a—Principles of Accounting
Science
Military

Suggested Electives

Foreign language continued
Hist. 1a—European History
Hist. 3a—History of United States
Pol. Sci. 1—American Government
Phil. 1—Logic

Prescribed Subjects

Econ. 3—Money and Banking
Rhet. 10—Business Writing
Acc'y 1b—Principles of Accounting
Science
Military

Suggested Electives

Foreign language continued
Hist. 1b—European History
Hist. 3b—History of United States
Pol. Sci. 3—State and Local Government

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Acc'y 2a—Advanced Accounting and Auditing
Econ. 10—Corporation Management
Econ. 5—Public Finance

Suggested Electives

Rhet. 22—Summarizing and Abstracting
Econ. 28—Domestic Commerce
Business Org. and Op. 1—Business Organization and Operation
Acc'y 4a—Cost Accounting

Prescribed Subjects

Acc'y 2b—Advanced Accounting and Auditing
Math. 23—Mathematics of Investment
Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution

Suggested Electives

Econ. 29—Foreign Commerce or
Econ. 31—Organization of Foreign Commerce
Econ. 11—Industrial Consolidations
Acc'y 4b—Cost Accounting

FOURTH YEAR FOR THE CLASS OF 1916

Prescribed Subjects

Acc'y 3a—Accounting Problems and Auditing
Bus. Law 1a—Commercial Law
Rhet. 25—Conference on Written Work

Suggested Electives

Econ. 9—Practical Banking
Econ. 51—Public Utilities
Econ. 12—Labor Problems
Phil. 9—Political Ethics
Bus. Org. and Op. 3—Business Procedure

Prescribed Subjects

Acc'y 3b—Accounting Problems and Auditing
Bus. Law 1b—Commercial Law
Rhet. 26—Conference on Written Work

Suggested Electives

Econ. 8—Money Market
Econ. 12—Labor Problems
Bus. Org. and Op. 4—Industrial Organization and Management

Courses in Railway Administration as Taught in 1915-16

All junior and senior students in railway administration are required to take part in the annual inspection trip of four days' duration, commencing on the morning of the Tuesday before the Easter recess. The expenses of each member of the party need not exceed \$12 to \$15.

General Course in Railway Administration

(Hitherto called Course in Railway Traffic and Accounting)

The subjects listed for the first year are prescribed for students of the class of 1919.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
Econ. 26—Economic Resources
Rhet. 1—Rhetoric and Themes
Math. 2—Advanced Algebra
Math. 4—Trigonometry
Military
Physical Training

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
Econ. 22—Economic History of the United States
Rhet. 2—Rhetoric and Themes
Math. 6—Analytic Geometry
Military
Physical Training

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
Acc'y 1a—Principles of Accounting
Pol. Sci. 1—American Government
Phys. 1a and 3a—Physics
Trans. 7—Railway Organization
Military

Prescribed Subjects

Econ. 3—Money and Banking
Acc'y 1b—Principles of Accounting
Rhet. 10—Business Writing
Phys. 1b and 3b—Physics
Trans. 12—Freight Shipment
Military

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Econ. 10—Corporation Management
Acc'y 2a—Advanced Accounting and Auditing
Trans. 1—Transportation System
Trans. 17—Railway Terminal Management or
Trans. 13—Railway Traffic Administration
Electives

Prescribed Subjects

Acc'y 2b—Advanced Accounting and Auditing
Trans. 26—Economics of Railway Location
and Maintenance or
Trans. 22—Railway Train Service
Trans. 2—Transportation Policy in Europe
and United States
Math. 23—Mathematics of Investment
Bus. Org. and Op. 2—Organization and Con-
trol of Mercantile Distribution

FOURTH YEAR FOR THE CLASS OF 1916

Prescribed Subjects

Acc'y 3a—Accounting Problems and Auditing
Trans. 13—Railway Traffic Administration or
Trans. 17—Railway Terminal Management
Trans. 35a—Thesis
Rhet. 25—Conference on Written Work
Bus. Law 1a—Commercial Law
Electives

Prescribed Subjects

Acc'y 3b—Accounting Problems and Auditing
Trans. 26—Economics of Railway Location
and Maintenance or
Trans. 22—Railway Train Service
Trans. 35b—Thesis
Rhet. 26—Conference on Written Work
Bus. Law 1b—Commercial Law
Electives

Course in Railway Transportation

The subjects listed for the first year are prescribed for students of the class of 1919. In choosing additional courses in the second, third, and fourth years as described below, in order to make up the 130 hours of credit, six hours must be taken in history, political science, advanced language, or philosophy.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
Rhet. 1—Rhetoric and Themes
G. E. D. 1—Elements of Drafting
Math. 2—Advanced Algebra
Math. 4—Trigonometry
Military
Physical Training

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
Rhet. 2—Rhetoric and Themes
G. E. D. 12—Descriptive Geometry
Math. 6—Analytic Geometry
Military
Physical Training

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
Math. 8—Calculus
Phys. 1a and 3a—Physics
Trans. 7—Railway Organization
Military

Prescribed Subjects

Econ. 3—Money and Banking
Rhet. 10—Business Writing
Phys. 1b and 3b—Physics
T. & A. M. 20—Analytical Mechanics
Trans. 12—Freight Shipment
Military

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Trans. 1—Transportation System
 Trans. 13—Railway Administration or
 Trans. 17—Railway Terminal Management
 T. & A. M. 21, 29—Analytical Mechanics and
 Resistance of Materials
 Electives

Prescribed Subjects

Trans. 2—Transportation Policy in Europe
 and the United States
 Trans. 22—Railway Train Service or
 Trans. 26—Economics of Railway Location
 and Maintenance
 M. E. 2—Steam Engineering

FOURTH YEAR FOR THE CLASS OF 1916

Prescribed Subjects

Trans. 17—Railway Terminal Management or
 Trans. 13—Railway Traffic Administration
 Trans. 35a—Thesis
 Rhet. 25—Conference on Written Work
 Acc'y 1a—Principles of Accounting
 Econ. 12—Labor Problems
 E. E. 11 and 61—Direct Current
 M. E. 62—Mechanical Engineering
 Econ. 12—Labor Problems

Prescribed Subjects

Trans. 26—Economics of Railway Location
 and Maintenance or
 Trans. 22—Railway Train Service
 Trans. 35b—Thesis
 Rhet. 26—Conference on Written Work
 Acc'y 1b—Principles of Accounting
 Econ. 12—Labor Problems
 E. E. 12 and 62—Alternating Current
 C. E. 76—Surveying

Course for Commercial Teachers as Taught in 1915-16

The subjects listed for the first year are prescribed for students of the Class of 1919. An option is allowed between Economics 26 and 7 the first semester, and between Economics 22 and 27 the second semester. In addition to prescribed subjects students must take sufficient electives to make a minimum of 15 hours, but not to exceed a maximum of 18 hours, of work each semester.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
 Econ. 26—Economic Resources or
 Econ. 7—English Economic History
 Rhet. 1—Rhetoric and Themes
 Foreign language
 Military
 Physical Training
 Electives

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
 Econ. 22—Economic History of United
 States or
 Econ. 27—Modern Industries
 Rhet. 2—Rhetoric and Themes
 Foreign language
 Military
 Physical Training
 Electives

SECOND YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Econ. 1—Principles of Economics
 Pol. Sci. 1—American Government
 Psychology 1—Intro. Psychology
 Hist. 3a—History of United States or
 Hist. 1a—European History
 Military

Prescribed Subjects

Econ. 3—Money and Banking
 Pol. Sci. 3—State and Local Government
 Psychology 2—Intro. Psychology
 Hist. 3b—History of United States or
 Hist. 1b—European History
 Rhet. 10—Business Writing
 Military

Suggested Electives

Foreign language continued
 Mathematics
 Science
 English literature

Suggested Electives

Foreign language continued
 Mathematics
 Science
 English literature

THIRD YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Acc'y 1a—Principles of Accounting
Educ. 1—Principles of Education
Econ. 28—Domestic Commerce
Econ. 10—Corporation Management

Suggested Electives

History
Foreign language continued
Phil. 1—Logic
Econ. 5—Public Finance
Pol. Sci. 4—Municipal Government
Rhet. 22—Summarizing and Abstracting
Bus. Org. and Op. 1—Business Organization and Operation

Prescribed Subjects

Acc'y 1b—Principles of Accounting
Educ. 2—History of Education
Econ. 29—Foreign Commerce or
Econ. 31—Organization of Foreign Commerce
Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution

Suggested Electives

History
Foreign language continued
Phil. 2—Introduction to Philosophy
Educ. 6—Principles of Secondary School Education

FOURTH YEAR FOR THE CLASS OF 1916

Prescribed Subjects

Rhet. 25—Conference on Written Work
Econ. 12—Labor Problems
Bus. Law 1a—Commercial Law
Educ. 10—Observation and Technique of Teaching

Suggested Electives

Acc'y 2a—Advanced Accounting and Auditing
Phil. 9—Political Ethics
Econ. 4—Financial History of United States
Econ. 9—Practical Banking
Bus. Org. and Op. 3—Business Procedure

Prescribed Subjects

Rhet. 26—Conference on Written Work
Econ. 12—Labor Problems
Bus. Law 1b—Commercial Law
Educ. 16—Social Education or
Educ. 15—School Hygiene

Suggested Electives

Acc'y 2b—Advanced Accounting and Auditing
Econ. 21—Socialism and Economic Reform
Trans. 12—Freight Shipment
Econ. 8—The Money Market
Bus. Org. and Op. 4—Industrial Organization and Management

Course in Foreign Commerce

The subjects listed for the first year are prescribed for students of the class of 1919. An option is allowed between Economics 26 and 7 the first semester and between Economics 22 and 27 the second semester. In addition to prescribe subjects students must take sufficient electives to make a minimum of 15 hours, but not to exceed a maximum of 18 hours, of work each semester.

NOTE.—This is a new course and is introduced because of the growing demand for trained service in foreign trade and more particularly in Latin-American trade. In the remaining years of the course emphasis will be laid on instruction in foreign language and correspondence, business organization and operation, history, international relations, foreign commerce, and international exchange and finance.

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

Acc'y 1a—Principles of Accounting
Econ. 26—Economic Resources or
Econ. 7—English Economic History
Rhet. 1—Rhetoric and Themes
Foreign language
Military
Physical Training
Electives

SECOND SEMESTER

Acc'y 1b—Principles of Accounting
Econ. 22—Economic History of United States or
Econ. 27—Modern Industries
Rhet. 2—Rhetoric and Themes
Foreign language
Military
Physical Training
Electives

Farm Organization and Management

Students taking this course will be enrolled in the College of Agriculture and will receive the degree of Bachelor of Science from that College.

FIRST YEAR

<i>Prescribed Subjects</i>	Hours	<i>Prescribed Subjects</i>	Hours
Chemistry 1.....	5	Chemistry 2a.....	5
Rhetoric 1.....	3	Rhetoric 2.....	3
Agronomy 25.....	4	Animal Husbandry 5.....	3
Horticulture 1a.....	2	Dairy Husbandry 3.....	1
Agricultural Extension 4.....	1	Horticulture 1b.....	2
Military	1	Military	2
Physical Training.....	1	Physical Training 8 and 21.....	1

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Animal Husbandry 8 and 21.....	3	Agronomy 26.....	3
Military 2.....	1	Military 2.....	1

In addition to the above courses the following are also prescribed:

Accountancy 11	3 Hours
Economics 2 or 1.....	3-5
Economics 16c	3
Economics 22	3
Economics 23	3
Economics 26	3
Elective Economics, minimum of.....	6
Farm Management 1.....	3
English 20	4
Philosophy 1.....	3
Elective Science, minimum of.....	15
Elective Agriculture, minimum of.....	28
Open electives	11-9

Total prescribed130 Hours

To avoid conflicts with other prescribed work it is suggested that the courses in Economics, Accountancy, and Farm Management be taken in the following order:

SECOND YEAR

Economics 26.....	3	Economics 22.....	3
		Economics 2	3

THIRD YEAR

Accountancy 11.....	3	Economics 14.....	2
		Economics 16c.....	3
		Farm Management 1.....	3

FOURTH YEAR

Economics 15.....	2	Economics 17.....	2
		Business Law 2.....	3

THE COLLEGE OF ENGINEERING

Engineering students should read the General Directions for Registration given in paragraphs 1-28 on pages 9-15. They should report for registration to Engineering Hall, where further special directions will be furnished them.

GENERAL ENGINEERING LECTURES FOR FRESHMEN

One general lecture sufficiently popular in character to interest and inspire young engineers, will be given each week. All freshmen engineers are required to attend this lecture.

SUMMER READING

All engineering students not graduates of a college of liberal arts and sciences are required to complete prescribed courses of reading of a non-professional character during the summer vacations following the freshmen and sophomore years. A circular on summer reading is issued, containing a list of books from which the student may choose. A statement of the books read during the summer is required at the beginning of the next college year.

TRIPS OF INSPECTION

Beginning with the academic year 1915-1916, inspection trips, which have heretofore been optional with students in the College of Engineering, will become one of the regular requirements in the senior year of the course leading to the degree of Bachelor of Science in architecture, architectural engineering, civil engineering, electrical engineering, mechanical engineering, mining engineering, and municipal and sanitary engineering.

The time required for these trips is three or four days, and the plants visited are usually in Chicago or Milwaukee. The trips are taken during term time under the supervision of University authorities. The expense to each student varies from \$15.00 to \$25.00.

APPROVED NON-TECHNICAL ELECTIVES

The following is a list of approved non-technical electives for students in the College of Engineering. Prerequisites must be observed.

Accountancy 10; Astronomy 3, 6, 7; Botany 5; Chemistry 16, 5a or 13a, 10b, 6, 7, 8, 31, 35, 65, 66, 69, 77, 78; Economics 1, 2, 3, 10, 12, 21, 25, 41; Education 1, 2, 16, 25, 41; English, any intermediate or advanced courses; French, any advanced courses; Geology 2, 5a, 13a, 13b, 14, 24, for students in mining any course in geology for which student has prerequisite; German, any third or fourth year courses; History 3; Italian 2; Mathematics 10, 16, 17, 19, 21, 23, 27; Philosophy 1, 17; Psychology 1, 2, 3, 4; Physics 14, 16, 17, 19, 21, 23, 27; Political Science 1, 3, 4; Rhetoric 17; Spanish 3, 4; Sociology 1, 3.

RHETORIC PREREQUISITE FOR JUNIOR STANDING

At its meeting of June 7, 1915, the University Senate approved the following recommendations of the College of Engineering with reference to requirements in the subject of rhetoric:

1. Rhetoric 1 and 2 shall hereafter be a prerequisite for junior standing in the College of Engineering, and no student in this College shall be permitted to register in more than eight hours of prescribed junior work without having passed or being registered in Rhetoric 1 or 2.
2. Any student in the College of Engineering whose written work shows that he is unable to use good English shall be reported by his instructor to a standing committee of the College of Engineering appointed for this purpose, which committee shall have the authority to direct the student to take as a prerequisite for graduation such additional instruction in rhetoric as may be prescribed by the department of English.

COURSES IN ENGINEERING

The several engineering courses are in process of transition between a former schedule followed by the classes entering prior to the year 1914-15, and a new schedule which will be effective for the freshman class of that year and subsequent classes.

The outlines which follow show the work of each year in the several courses as taught during 1915-16. They do not show either the old or the new curriculum as a whole. Freshmen will take the "First Year" as here scheduled; and regular sophomores, juniors, and seniors will take the "Second Year," "Third Year," and "Fourth Year," respectively; but these schedules *must not be used* for checking up on a student's previous work in his course or in planning the work of subsequent years. For such check or planning consult with the Assistant Dean of the College.

Course in Architecture

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Arch. 31 ² —Arch. and Freehand Drawing...	4	Arch. 32—Arch. and Freehand Drawing...	4
G. E. D. 2—Descriptive Geometry.....	4	Chem. 1a ³ or 1b—Inorganic Chemistry 3 or 4	
Math. 2—Advanced Algebra.....	3	Rhet. 2—Rhetoric and Themes.....	3
Math. 4—Trigonometry.....	2	T. & A. M. 14—Elem. Mechanics.....	4
Rhetoric 1—Rhetoric and Themes.....	3	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Phys. Tr. 1—Gymnasium.....	1	Phys. Tr. 2—Gymnasium.....	1
Engineering Lecture	0	Engineering Lecture	0
Total	18	Total	17 or 18

Summer Reading, 50 points

SECOND YEAR

Arch. 13—History of Architecture.....	2	Arch. 14—History of Architecture.....	2
Arch. 23—Freehand Drawing.....	2	Arch. 24—Freehand Drawing	2
Arch. 33—Design	3	Arch. 34—Design	3
Arch. 43—Working Drawings.....	3	Arch. 44—Working Drawings	3
Phys. 9a—Physics Lectures.....	2	Phys. 9b—Physics Lectures.....	2
Phys. 10a—Physics Laboratory.....	2	Phys. 10b—Physics Laboratory.....	2
T. & A. M. 15—Strength of Materials... 3		T. & A. M. 16—Strength of Materials... 3	
Mil. 2c—Military Drill	1	Mil. 2d—Military Drill	1
Total	18	Total	18

Summer Reading, 50 points

¹Semester hours. For definition, see page 81.

²The numbers refer to courses in the Description of Courses, page 81.

³Students who have had chemistry in the high school equivalent to Chemistry 1b will register in Chemistry 1a.

THIRD YEAR

Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture	2
Arch. 25—Freehand Drawing	2	Arch. 26—Freehand Drawing	2
Arch. 35—Design	5	Arch. 36—Design	5
Arch. 45—Graphic Statics	3	Arch. 46—Graphic Statics	3
Arch. 55—Building Sanitation	1	Arch. 66—Theory of Architecture	1
Arch. 65—Theory of Architecture	1	E. E. 90—Building Illumination	1
French or German	4	French or German	4
Total	18	Total	18

FOURTH YEAR

Arch. 27—Freehand Drawing	2	Arch. 28—Freehand Drawing	2
Arch. 37—Design	7	Arch. 38—Advanced Design or Thesis... 7	
Arch. 67—Theory of Form and Color ... 2		Arch. 60—Estimating	1
Econ. 2—Principles of Economics	2	Arch. 68—Specifications	3
M. E. 25—Heating and Ventilation..... 2		*Non-technical Elective	3
*Non-technical Elective.....	3		
Inspection Trip	0		
Total	18	Total	16

Course in Architectural Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1a or 1b—Inorganic Chemistry.....	3 or 4	Chem. 4—Qualitative Analysis	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Desc. Geometry	4
Math. 2—Advanced Algebra	3	Math. 6—Analytical Geometry	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes	3
Rhet. 1—Rhetoric and Themes.....	3	Mil. 1—Drill Regulations	1
Mil. 2a—Military Drill	1	Mil. 2b—Military Drill.....	1
Phys. Tr. 1—Gymnasium	1	Phys. Tr. 2—Gymnasium	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1918

Arch. 13—History of Architecture.....	2	Arch. 14—History of Architecture.....	2
A. E. 33—Arch. and Freehand Drawing .. 3		A. E. 34—Design	3
A. E. 43—Working Drawings.....	2	A. E. 44—Working Drawings	2
Math. 7—Differential Calculus	5	Math. 9—Integral Calculus	3
Phys. 1a—Physics Lectures	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory	2	Phys. 2b—Physics Laboratory.....	2
Mil. 2c—Military Drill	1	T. & A. M. 20—Analytical Mech..... 3	
		Mil. 2d—Military Drill	1
Total	18	Total	18

Summer Reading, 50 points

THIRD YEAR FOR THE CLASS OF 1917

Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture.....	2
A. E. 45—Graphic Statics	3	A. E. 46—Graphic Statics	3
Chem. 1a or 1b—Inorganic Chem..... 3 or 4		Chem. 4—Qualitative Analysis	4
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
T. & A. M. 25—Resistance of Materials... 4		T. & A. M. 26—Analytic Mechanics and	
Non-technical Elective	2	Hydraulics	4
		Non-technical Elective.....	2
Total	17 or 18	Total	18

*Any approved non-technical course requiring Sophomore standing. See printed list of approved non-technical electives.

FOURTH YEAR FOR THE CLASS OF 1916

A. E. 47—Architectural Engineering.....	5	A. E. 48—Architectural Engineering.....	5
A. E. 57—Fireproof Construction.....	2	A. E. 58—Fireproof Construction.....	2
M. E. 23—Mech. Equipment of Buildings..	5	A. E. 68—Estimates and Specifications...	4
Non-technical Elective.....	3	E. E. 92—Lighting and Wiring.....	2
Inspection Trip	0	Non-technical Elective.....	3
Total	15	Total	16

Revised Course in Ceramic Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1a or 1b—Inorganic Chemistry 3 or 4		Chem. 4—Qualitative Analysis	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill	1	Mil. 2b—Military Drill.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR

Chem. 5a—Quantitative Analysis	5	Chem. 5b—Quantitative Analysis.....	5
Phys. 1a—Physics Lectures	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Math. 7—Differential Calculus	5	Math. 9—Integral Calculus.....	3
Min. 3—Mining Principles.....	2	T. & A. M. 20—Analytical Mechanics...	3
Mil. 2c—Military Drill	1	Cer. 1—Ceramic Materials.....	3
		Mil. 2d—Military Drill.....	1
Total	18	Total	19
Summer Reading, 50 points			

THIRD YEAR

Cer. 2—Winning and Preparation of Clays	3	Cer. 5—Ceramic Bodies.....	5
Cer. 3—Industrial Calculations.....	3	Cer. 12—Designing and Shaping.....	3
Language	4	Cer. 10—Cements	3
T. & A. M. 21—Analytical Mechanics...	2	C. E. 76—Surveying	2
T. & A. M. 25—Resist. of Materials.....	4	Language	4
Chem. 65	2		
Total	18	Total	17

FOURTH YEAR

Geol. 13a—Engineering Geology.....	3	Geol. 13b—Engineering Geology.....	3
Cer. 4—Drying and Burning.....	4	Cer. 8—Glass	2
Cer. 6—Glazes	5	Cer. 9—Ceramic Construction.....	4
Cer. 17—Silicates	3	M. E. 62—Mech. Eng. Laboratory.....	3
Non-technical Elective.....	3	Ceramic Thesis or Technical Elective...	3
Total	18	Total	15

Course in Civil Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1a or 1b—Inorganic Chemistry	3 or 4	Chem. 4—Inorganic Chemistry	4
G. E. D. 1—Elements of Drafting	4	G. E. D. 2—Descriptive Geometry	4
Rhet. 1—Rhetoric and Themes	3	Rhet. 2—Rhetoric and Themes	3
Math. 2—Advanced Algebra	3	Math. 6—Analytical Geometry	5
Math. 4—Trigonometry	2	Mil. 1—Drill Regulations	1
Mil. 2a—Military Drill	1	Mil. 2b—Military Drill	1
P. T. 1—Gymnasium	1	P. T. 2—Gymnasium	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1918

C. E. 27—Plane Surveying	3	C. E. 28—Higher Surveying	3
Math. 7—Differential Calculus	5	Math. 9—Integral Calculus	3
Phys. 1a—Physics Lecture	3	Phys. 1b—Physics Lecture	2
Phys. 3a—Physics Laboratory	2	Phys. 3b—Physics Laboratory	2
Rhet. 1—Rhetoric and Themes	3	Rhet. 2—Rhetoric and Themes	3
Mil. 2c—Military Drill	1	T. & A. M. 20—Analytic Mechanics	3
Elective	2	Mil. 2d—Military Drill	1
		Elective	2
Total	19	Total	19

Summer Reading, 50 points

THIRD YEAR FOR THE CLASS OF 1917

C. E. 51—Railroad Surveying	5	C. E. 52—Roads and Pavements	3
M. E. 1—Steam Engines and Boilers	3	C. E. 60—Structural Stresses	4
T. & A. M. 21—Analytical Mechanics	2	C. E. 62—Structural Details	2
T. & A. M. 29—Resistance of Materials	5	C. E. 70—Seminar	1
Non-technical Elective	3	T. & A. M. 10—Hydraulics	3
		Non-technical Elective	3
Total	18	Total	16

FOURTH YEAR FOR THE CLASS OF 1916

I. General Civil Engineering Option

C. E. 77—Masonry Construction	4	C. E. 80—Contracts and Specifications	2
C. E. 79—Cement Laboratory	1	E. E. 4—Elementary Electrical Engineering	2
C. E. 81—Theory of Reinforced Concrete	2	E. E. 64—Electrical Engineering Laboratory	1
C. E. 83—Bridge Design	3	M. & S. E. 3—Sewerage	3
M. & S. E. 2—Water Supply Engineering	4	Non-technical Elective	3
Technical Elective	2	Technical Elective	5
Inspection Trip	0		
Total	16	Total	16

II. Structural Engineering Option

C. E. 77—Masonry Construction	4	C. E. 80—Contracts and Specifications	2
C. E. 79—Cement Laboratory	1	C. E. 82—Concrete Design, or	
C. E. 81—Theory of Reinforced Concrete	2	C. E. 84—Concrete Buildings	4
C. E. 85—Steel Bridge Design	5	C. E. 88—Steel Building Design	4
C. E. 87—Advanced Bridge Analysis	2	M. & S. E. 3—Sewerage	3
M. & S. E. 2—Water Supply Engineering	4	Non-technical Elective	3
Inspection Trip	0		
Total	18	Total	16

III. Highway Engineering Option

C. E. 77—Masonry Construction.....	4	C. E. 80—Contracts and Specifications....	2
C. E. 79—Cement Laboratory.....	1	C. E. 92—Concrete Bridges and Culverts.	2
C. E. 81—Theory of Reinforced Concrete.	2	C. E. 94—Highway Administration.....	3
C. E. 91—Highway Bridge Design.....	4	C. E. 96—Road Laboratory.....	2
C. E. 93—Road Construction	3	Chem. 73—Asphalt, Tar, etc.....	2
M. & S. E. 2—Water Supply Engineering	4	Technical Elective	2
Inspection Trip	0	Non-technical Elective	3
Total	18	Total	16

Technical Electives

C. E. 83—Bridge Design	3	C. E. 76—General Surveying	2
C. E. 85—Steel Bridge Design.....	5	C. E. 82—Concrete Design	4
C. E. 87—Advanced Bridge Analysis	2	C. E. 84—Concrete Buildings	4
C. E. 91—Highway Bridge Design	4	C. E. 88—Steel Building Design	4
C. E. 93—Road Construction	3	C. E. 92—Highway Bridge Design.....	4
C. E. 97—Thesis*	1	C. E. 94—Highway Administration.....	3
Min. 6a—M. E. of Mines.....	3	C. E. 96—Road Laboratory.....	2
R. E. 33—Economy of Railway Location ..	4	C. E. 98—Thesis*	2 or 3
		Chem. 73—Asphalts, Tar, etc.....	2
		E. E. 4—Electrical Engineering.....	2
		E. E. 64—Electrical Engineering Labor- atory	1
		Min. 1—Earth and Rock Excavation	3
		M. & S. E. 9—Hydraulic Design and Con- struction	2
		M. & S. E. 3—Sewerage	3
		R. E. 31—Railway Yards and Terminals..	3

Course in Electrical Engineering as Taught in 1915-16**FIRST YEAR FOR THE CLASS OF 1919****FIRST SEMESTER****Hours**

Chem. 1a or 1b—Inorganic Chemistry.	3 or 4
G. E. D. 1—Elements of Drafting.....	4
Math. 2—Algebra	3
Math. 4—Trigonometry	2
Rhet. 1—Rhetoric and Themes	3
Mil. 2a—Military Drill	1
P. T. 1—Gymnasium	1
Engineering Lecture	0

Total17 or 18

SECOND SEMESTER**Hours**

Chem. 4—Qualitative Analysis.....	4
G. E. D. 2—Descriptive Geometry.....	4
Math. 6—Analytic Geometry.....	5
Rhet. 2—Rhetoric and Themes.....	3
Mil. 1—Drill Regulations	1
Mil. 2b—Military Drill.....	1
P. T. 2—Gymnasium	1
Engineering Lecture	0

Total19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1918

Language	4	Language	4
Math. 7—Differential Calculus	5	Chem. 1—Inorganic Chemistry.....	4
M. E. 81—Machine Work	3	Math. 9—Integral Calculus	3
Phys. 1a—Physics Lectures	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill	1	T. A. M. 20—Analytic Mechanics.....	3
		Mil. 2d—Military Drill	1
Total	18	Total	19

Summer Reading, 50 points

*Only students having high grades may elect a thesis.

THIRD YEAR FOR THE CLASS OF 1917

Chem. 4—Qualitative Analysis	4	E. E. 26—Alternating Currents.....	4
E. E. 25—Direct Current Apparatus.....	4	E. E. 76—Elec. Eng. Laboratory.....	2
E. E. 75—Elec. Eng. Laboratory.....	2	M. E. 2—Steam Engineering.....	3
Math. 9a—Integral Calculus.....	2	Phys. 4b—Elec. and Mag. Measurement... 2	
Phys. 4a—Elec. and Mag. Measurement... 2		T. A. M. 26—Anal. Mechanics and Hy-	
T. A. M. 25—Resistance of Materials.....	4	draulics.....	4
		Non-technical Elective	3
Total	18	Total	18

FOURTH YEAR FOR THE CLASS OF 1916

E. E. 95—Seminar	1	E. E. 96—Seminar	1
E. E. 14—Alternating Current Apparatus . 4		E. E. 17—Alternating Current Apparatus . 4	
E. E. 24—Elec. Eng. Laboratory.....	2	E. E. 27—Elec. Eng. Laboratory.....	2
E. E. 55—Electrical Design.....	2	E. E. 56—Electrical Design.....	4
M. E. 61—Power Measurement.....	3	E. E. 99—Thesis* or elective.....	3
M. E. 11—Thermodynamics	3	Non-technical Elective	3
Non-technical Elective.....	3		
Inspection Trip	0		
Total	18	Total	17

Course in Mechanical Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER

	Hours
Chem. 1a or 1b—Inorganic Chemistry 3 or 4	
G. E. D. 1—Elements of Drafting.....	4
Math. 2—Algebra	3
Math. 4—Trigonometry	2
Rhet. 1—Rhetoric and Themes.....	3
Mil. 2a—Military Drill	1
P. T. 1—Gymnasium	1
Engineering Lecture	0
Total	17 or 18

SECOND SEMESTER

	Hours
Chem. 4—Qualitative Analysis.....	4
G. E. D. 2—Descriptive Geometry.....	4
Math. 6—Analytical Geometry.....	5
Rhet. 2—Rhetoric and Themes	3
Mil. 1—Drill Regulations	1
Mil. 2b—Military Drill	1
P. T. 2—Gymnasium	1
Engineering Lecture	0
Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1918

Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 75 & 77—Forge and Foundry, <i>or</i>		M. E. 75 & 77—Forge and Foundry, <i>or</i>	
M. E. 79—Pattern work.....	3	M. E. 79—Pattern work.....	3
Phys. 1a—Physics Lectures	3	Phys. 1b—Physics Lectures	2
Phys. 3a—Physics Laboratory	2	Phys. 3b—Physics Laboratory	2
Rhet. 1—Rhetoric and Themes	3	Rhet. 2—Rhetoric and Themes.....	3
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytical Mechanics.... 3	
		Mil. 2d—Military Drill	1
Total	17	Total	17

Summer Reading, 50 points

THIRD YEAR FOR THE CLASS OF 1917

Chem. 1a or 1b—Inorganic Chemistry 3 or 4		Chem. 16—Engineering Chemistry.....	3
Math. 9a—Integral Calculus.....	2	M. E. 12—Thermodynamics	5
T. A. M. 27—Analytical Mechanics.....	3	M. E. 30—Mechanics of Machinery.....	5
T. A. M. 29—Resistance of Materials.....	5	M. E. 64—Power Measurement.....	3
Non-technical Elective.....	3		
Total	16 or 17	Total	16

*Only students having high grades may elect a thesis.

FOURTH YEAR FOR THE CLASS OF 1916

E. E. 11—Direct Current Apparatus.....	3	E. E. 12—Alternating Current Apparatus. 3	
E. E. 61—Direct Current Laboratory.....	1	E. E. 62—Alternating Current Laboratory. 1	
M. E. 15—Gas Power Engineering <i>or</i>		M. E. 26—Heating and Ventilation.....	3
M. E. 37—Principles of Management....	3	M. E. 32—Power Transmission.....	3
M. E. 43—Engineering Design.....	5	M. E. 44—Engineering Design <i>or</i>	
M. E. 65—Power Laboratory.....	3	M. E. 66—Power Laboratory.....	2
Non-technical Elective.....	3	M. E. 52—Power Plant Design <i>or</i>	
Inspection trip.....	0	M. E. 54—Industrial Plant Design.....	3
Total	18	Total	15

Course in Mining Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1a or 1b—Inorganic Chemistry 3 or 4		Ch m. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1918

Geol. 13a—Engineering Geology.....	3	Geol. 13b—Engineering Geology.....	3
Physics 1a—Physics Lectures	3	Math. 9—Integral Calculus.....	3
Physics 3a—Physics Laboratory.....	2	Physics 1b—Physics Lectures	2
Math. 7—Differential Calculus.....	5	Physics 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytical Mechanics....	3
Language	4	Mil. 2d—Military Drill.....	1
		Language	4
Total	18	Total	18

Summer Reading, 50 points

THIRD YEAR FOR THE CLASS OF 1917

Chem. 5b—Quantitative Analysis.....	4	C. E. 58—Graphic Statics.....	2
C. E. 27—Surveying.....	3	E. E. 4—Elementary Electrical Engineer-	
Geol. 13a—Engineering Geology.....	3	ing	2
M. E. 1—Steam Engineering.....	3	E. E. 64—Electrical Engineering Labora-	
T. & A. M. 25—Resistance of Materials..	4	tory	1
		Geol. 13b—Engineering Geology.....	3
		Mining 4—Mining Methods.....	2
		Mining 6—Mechanical Engineering of	
		Mines	2
		T. & A. M. 26—Analytic Mechanics and	
		Hydraulics	4
Total	17	Total	16

FOURTH YEAR FOR THE CLASS OF 1916

I. Coal Mining Option

	Hours		Hours
Chem. 7—Metallurgy.....	3	Mining 8—Mine Law, Admin. and Ac-	
Chem. 65—Technical Gas and Fuel An-		counts.....	3
alysis.....	2	Mining 13—Utilization of Coal.....	2
Min. 5—Mine Ventilation.....	3	Mining 42—Coal Plant Design.....	2
Min. 9—Coal and Ore Preparation.....	3	Mining 62—Mine Surveying.....	3
Min. 41—Principles of Coal Plant Design.	3	Mining 64—Coal Mine Laboratory.....	3
Non-technical Elective.....	3	Mining 68—Mine Topography.....	1
Inspection Trip.....	0	Mining 90—Journal Meeting.....	1
		Non-technical Elective.....	3
Total	17	Total	18

II. Ore Mining Option

Chem. 7—Metallurgy.....	3	Geol. 2—Economic Geology.....	3
Chem. 69—Metallurgical Laboratory and		Min. 8—Mine Law, Administration and	
Assaying.....	2	Accounts.....	3
Min. 15—Principles of Mine Ventilation..	1	Min. 44—Ore Plant Design.....	2
Min. 19—Ore and Coal Preparation.....	3	Min. 62—Mine Surveying.....	3
Min. 21—Mine Examination and Valua-		Min. 66—Ore Concentration Laboratory..	3
tion.....	2	Min. 90—Journal Meeting.....	1
Min. 43—Principles of Ore Plant Design..	3	Non-technical Elective.....	3
Non-technical Elective.....	3		
Inspection Trip.....	0		
Total	17	Total	18

III. Metallurgical Option

Chem. 7—Metallurgy.....	3	Chem. 7a—Non-ferrous Metallurgy.....	3
Chem. 65—Technical Gas and Fuel An-		Chem. 70—Metallurgical Laboratory.....	3
alysis.....	2	Mining 8—Mine Law, Administration and	
Chem. 69—Metallurgical Laboratory and		Accounts.....	3
Assaying.....	2	Mining 46—Mill and Smelter Design....	2
Min. 17—Problems.....	1	Mining 66—Ore Concentration Laboratory.	3
Min. 19—Ore and Coal Preparation.....	3	Mining 90—Journal Meeting.....	1
Min. 45—Principles of Mill and Smelter		Non-technical Elective.....	3
Design.....	3		
Non-technical Elective.....	3		
Inspection Trip.....	0		
Total	17	Total	18

Course in Municipal and Sanitary Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER	Hours	SECOND SEMESTER	Hours
Chem. 1a or 1b—Inorganic Chemistry 3 or 4		Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1918

C. E. 27—Plane Surveying.....	3	C. E. 28—Higher Surveying.....	3	
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3	
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2	
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2	
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3	
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytic Mechanics.....	3	
		Mil. 2d—Military Drill.....	1	
Total		17	Total	17
Summer Reading, 50 points				

THIRD YEAR FOR THE CLASS OF 1917

Botany 6—Bacteriology.....	2	Chem. 2a, 10b—Qualitative and Water Analysis.....	5
Chem. 1b or 1a—Inorganic Chemistry....	4	C. E. 60—Structural Stresses.....	4
C. E. 53—Railroad Surveying.....	3	C. E. 52—Roads and Pavements.....	3
T. & A. M. 21—Analytic Mechanics.....	2	M. E. 2—Steam Engineering.....	3
T. & A. M. 29—Resistance of Materials...	5	T. & A. M. 10—Hydraulics.....	3
Non-technical Elective.....	2		
<hr/>		<hr/>	
Total	18	Total	18

FOURTH YEAR FOR THE CLASS OF 1916

C. E. 77—Masonry Construction.....	4	C. E. 62—Structural Details.....	2
C. E. 79—Cement Laboratory.....	1	C. E. 80—Contracts and Specifications....	2
C. E. 81—Reinforced Concrete.....	2	E. E. 4—Elementary Electrical Engineer- ing.....	2
M. E. 61—Steam Laboratory.....	2	E. E. 64—Electrical Engineering Laboratory	1
M. & S. E. 2—Water Supply Engineering.	4	M. & S. E. 3 —Sewerage	3
M. & S. E. 6a—Water Purification and Sewage Disposal.....	3	M. & S. E. 6b—Water Purification and Sew- age Disposal.....	2
Inspection Trip.....	0	M. & S. E. 9—Hydraulic Design and Con- struction	2
		M. & S. E. 99—Thesis or Approved Elective	3
Total	16	Total	17

Course in Railway Civil Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1a or 1b—Inorganic Chemistry	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Mil. 1—Military Drill.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Drill Regulations.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Engineering Lecture	0	Engineering Lecture.....	0
<hr/>		<hr/>	
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR FOR THE CLASS OF 1918

C. E. 27—Surveying.....	3	C. E. 28—Topographical Surveying.....	3
Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill	1	T. & A. M. 20—Analytic Mechanics.....	3
		Mil. 2d—Military Drill.....	1
<hr/>		<hr/>	
Total	18	Total	18
Summer Reading, 50 points			

THIRD YEAR FOR THE CLASS OF 1917

C. E. 51—Railroad Surveying.....	5	C. E. 60—Structural Stresses.....	4
R. E. 25—Railway Development.....	3	R. E. 31—Railway Yards and Terminals...	3
Rhet. 1—Rhetoric and Themes.....	3	R. E. 34—Ry. Maintenance.....	4
T. & A. M. 21—Analytic Mechanics.....	2	Rhet. 2—Rhetoric and Themes.....	3
T. & A. M. 29—Resistance of Materials...	5	T. & A. M. 10—Hydraulics.....	3
Total	18	Total	17

FOURTH YEAR FOR THE CLASS OF 1916

C. E. 77—Masonry Construction.....	4	C. E. 80—Engineering Construction and Specifications	2
C. E. 79—Cement Laboratory.....	1	E. E. 4—Elementary Elec. Eng.....	2
C. E. 81—Reinforced Concrete Theory...	2	E. E. 64—Electrical Eng. Laboratory.....	1
C. E. 83—Bridge Design.....	3	Non-technical Elective.....	3
M. E. 11—Steam Engines and Boilers...	3	R. E. 30—Thesis	3
R. E. 32—Railway Construction.....	3	R. E. 33—Railway Location.....	5
R. E. 35—Railway Signaling.....	1	R. E. 51—Seminar	1
R. E. 50—Seminar	1	Total	17
Total	18	Total	17

Course in Railway Electrical Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1a or 1b—Inorganic Chemistry 3 or 4	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	4	Math. 6—Analytic Geometry.....	5
Math. 4—Plane Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	18
Summer Reading, 50 points			

SECOND YEAR FOR THE CLASS OF 1918

Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 75—Forge Work.....	1	M. E. 79—Pattern Work.....	3
M. E. 77—Foundry Work.....	2	Phys. 1b—Physics Lectures.....	2
Phys. 1a—Physics Lectures.....	3	Phys. 3b—Physics Laboratory	2
Phys. 3a—Physics Laboratory	2	T. & A. M. 20—Analytic Mechanics.....	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Total	18	Total	18
Summer Reading, 50 points			

THIRD YEAR FOR THE CLASS OF 1917

Chem. 4—Qualitative Analysis.....	4	E. E. 26—Alternating Currents.....	4
E. E. 25—D. C. Apparatus.....	4	E. E. 76—Electrical Laboratory.....	2
E. E. 75—Electrical Laboratory.....	2	Non-technical Elective.....	3
Phys. 4a—Electrical and Magnetic Measurements	2	M. E. 2—Steam Engineering.....	3
R. E. 25—Railway Development.....	3	Phys. 4b—Electrical and Magnetic Measurements	2
T. & A. M. 25—Resistance of Materials...	4	R. E. 60—Electric Railway Principles....	2
Total	19	T. & A. M. 36—Analytic Mechanics.....	2
Total	19	Total	18

FOURTH YEAR FOR THE CLASS OF 1916

Elective	3	E. E. 56—Electrical Design.....	4
M. E. 11—Thermodynamics	3	Non-technical Elective.....	3
M. E. 61—Mechanical Laboratory.....	2	R. E. 63—Electric Railway Laboratory....	2
R. E. 62—Electric Railway Laboratory....	2	R. E. 65—Electric Railway Economics....	4
R. E. 64—Electric Railway Practise.....	3	R. E. 30—Thesis (or elective).....	3
R. E. 66—Electric Railway Machinery....	3		
R. E. 67—Seminar	1		
Total	17	Total	16

Course in Railway Mechanical Engineering as Taught in 1915-16

FIRST YEAR FOR THE CLASS OF 1919

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Chem. 1b or 1a—Inorganic Chemistry 3 or 4		Chem. 4—Advanced Chemistry.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Mil. 2b—Military Drill.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
P. T. 1—Gymnasium.....	1	P. T. 2—Gymnasium.....	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1918

Language	4	Language	4
Math. 7—Differential Calculus.....	5	M. E. 75—Forge Work.....	1
M. E. 79—Pattern Work.....	3	M. E. 77—Foundry Work.....	2
Phys. 1a—Physics Lectures.....	3	Math. 9—Integral Calculus.....	3
Phys. 3a—Physics Laboratory.....	2	Phys. 1b—Physics Lectures.....	2
Mil. 2c—Military Drill.....	1	Phys. 3b—Physics Laboratory.....	2
		T. & A. M. 20—Analytic Mechanics.....	3
		Mil. 2d—Military Drill.....	1
Total	18	Total	18

Summer Reading, 50 points

THIRD YEAR FOR THE CLASS OF 1917

Chem. 1a or 1b—Inorganic Chemistry 3 or 4		Chem. 16—Engineering Chemistry.....	3
Non-technical Elective.....	3	Non-technical Elective.....	3
Math. 9a—Integral Calculus.....	2	M. E. 12—Thermodynamics	5
R. E. 25—Ry. Development.....	3	M. E. 64—Power Measurement.....	3
T. & A. M. 27—Analytic Mechanics.....	3	R. E. 6—Locomotives.....	4
T. & A. M. 25—Resistance of Materials....	4		
Total	18 or 19	Total	18

FOURTH YEAR FOR THE CLASS OF 1916

Non-technical Elective.....	3	Non-technical Elective.....	2
E. E. 11—D. C. Apparatus.....	3	E. E. 12—A. C. Apparatus.....	3
E. E. 61—D. C. Laboratory.....	1	E. E. 62—A. C. Laboratory.....	1
M. E. 37—Science of Management.....	3	R. E. 7—Adv. Design.....	3
R. E. 2—Locomotive Design.....	3	R. E. 8—Railway Laboratory.....	2
R. E. 5—Railway Laboratory.....	3	R. E. 30—Thesis	3
R. E. 9—Seminar	1	R. E. 61—Traction	3
Total	17	Total	17

THE COLLEGE OF AGRICULTURE

Agricultural students should read the General Directions given in paragraphs 1-28 on pages 9-15. Further special directions will be furnished them with their study-lists.

REQUIREMENTS FOR GRADUATION

Students who have satisfied all matriculation requirements and have maintained throughout their course a satisfactory record of scholarship and moral character will be graduated with the degree of Bachelor of Science, upon having completed the studies of the prescribed list and sufficient electives to make a total of 130 semester hours.

A thesis is not required for graduation, but any student who has completed not less than 90 hours of credit before the senior year may then elect a thesis course in any department in which he has done not less than 20 hours' work, subject to the approval of the head of the department in question.

Graduates of approved colleges may expect to secure a degree in agriculture from the University of Illinois upon completion of the technical and scientific requirements. This will ordinarily require approximately two years of residence work; a minimum of one year will be exacted.

General Course in Agriculture

All students except those in the special courses in household science, floriculture, and landscape gardening are required to take the same work during the freshman year and part of the sophomore year. This work gives the student a correct conception of the fundamental farm practises and an insight into the technical branches of agriculture, such as animal and dairy husbandry, horticulture, farm crops, soils, farm mechanics, buildings, etc., and leaves the junior and senior years open for election.

One hundred thirty hours are required for graduation, as follows:

Agriculture prescribed first two years.....19 hours

Agriculture prescribed as electives.....40 hours

Total agriculture required..... 59 hours

Non-agriculture prescribed42 hours

Non-agriculture prescribed as electives.....15 hours

Total non-agriculture required..... 57 hours

Open electives 14 hours

130 hours

College of Agriculture

PRESCRIBED SUBJECTS

Required for the Degree of Bachelor of Science in the General Course in Agriculture

FIRST YEAR

<i>First Semester</i>	Hours	<i>Second Semester</i>	Hours
Chemistry 1 or 1a.....	5-3	Chemistry 2a	5
Rhetoric 1*	3	Rhetoric 2	3
Agronomy 25	4	Animal Husbandry 5.....	3
Horticulture 1a	2	Dairy Husbandry 3	1
Agricultural Extension 4.....	1	Horticulture 1b	2
Military 2a	1	Military 1 and 2b.....	2
Physical Training	1	Physical Training	1

SECOND YEAR

Chemistry 13a or Botany 1.....	5	Botany 1 or Chemistry 13a.....	5
Animal Husbandry 8 and 21.....	3	Agronomy 26	3
Military 2c	1	Military 2d	1
Electives		Electives	

In addition to the above, students will take the following:

Agriculture, electives.....	40 hours
Non-agriculture, electives	15 hours
English 20	4 hours
Science, elective	5 hours
Open electives	14 hours

General Course in Farm Organization and Management

Students taking this course will be enrolled* in the College of Agriculture and will receive the degree of Bachelor of Science from that College.

FIRST YEAR

<i>FIRST SEMESTER</i>		<i>SECOND SEMESTER</i>	
<i>Prescribed Subjects</i>	Hours	<i>Prescribed Subjects</i>	Hours
Chemistry 1.....	5	Chemistry 2a	5
Rhetoric 1.....	3	Rhetoric 2	3
Agronomy 25.....	4	Animal Husbandry 5.....	3
Horticulture 1a.....	2	Dairy Husbandry 3.....	1
Agricultural Extension 4.....	1	Horticulture 1b.....	2
Military	1	Military	2
Physical Training.....	1	Physical Training.....	1

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Animal Husbandry 8 and 21.....	3	Agronomy 26.....	3
Military 2.....	1	Military 2.....	1

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See page 12.

In addition to the above courses the following are also prescribed:

Accountancy 11	3	Hours
Economics 2 or 1	3-5	
Economics 16c	3	
Economics 22	3	
Economics 23	3	
Economics 26	3	
Elective Economics, minimum of	6	
Farm Management 1	3	
English 20	4	
Philosophy 1	3	
Elective Science, minimum of	15	
Elective Agriculture, minimum of	28	
Open Electives	11-9	

Total prescribed130 Hours

To avoid conflicts with other prescribed work it is suggested that the courses in Economics, Accountancy, and Farm Management be taken in the following order:

SECOND YEAR

Economics 26.....	3	Economics 22.....	3
		Economics 2	3

THIRD YEAR

Accountancy 11.....	3	Economics 14.....	2
		Economics 16c	3
		Farm Management 1.....	3

FOURTH YEAR

Economics 15.....	2	Economics 17.....	2
		Business Law 2.....	3

General Course in Floriculture

The object of this course is to fit men and women for the profession of floriculture. The laboratory exercises in the technical subjects consists of practical work in the greenhouses and gardens and give the students a working knowledge of the best methods now in use.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
<i>Prescribed Subjects</i>	Hours	<i>Prescribed Subjects</i>	Hours
Entomology 4a.....	3	Chemistry 2a	5
Chemistry 1 or 1a.....	5 or 3	Horticulture 5.....	5
Horticulture 4.....	4	Rhetoric 2.....	3
Rhetoric 1.....	3	Military	2
Military	1	Physical Training.....	1
Physical Training.....	1		—
Total	15 or 17	Total	16

SECOND YEAR

Botany 1.....	5	Agronomy 9.....	5
English 20.....	4	Horticulture 15a.....	5
Military	1	Military	1
Total	10	Total	11

THIRD YEAR

Botany 7a.....	5	Botany 3b.....	5
Horticulture 15b.....	5	Horticulture 7.....	3
Economics 2.....	3	Horticulture 24a.....	3
Total	13	Total	11

College of Agriculture

FOURTH YEAR

Horticulture 31.....	3	Horticulture 30.....	5
Horticulture 24b.....	3	Horticulture 42.....	3
		Horticulture 32.....	4
Total	6	Total	12

Suggested Electives

Accountancy	Chemistry 13a
Agronomy 12	Economics
Animal Husbandry 30	Horticulture 28
Botany 3a, 4a, 7b	

General Course in Landscape Gardening

A four years' course in preparation for professional practise of landscape architecture. Courses are open to any student in the University having the prerequisites or their equivalents.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

	Hours
Hort. 10a—Rural Improvement.....	2
Math. 4—Trigonometry.....	2
Rhet. 1—Rhetoric and Themes.....	3
Arch. 31—Drawing.....	4
Botany 1—Introductory Course.....	5
Mil. 2a—Military Drill.....	1
P. T. 1—Gymnasium.....	1
Total	18

SECOND SEMESTER

Prescribed Subjects

	Hours
Hort. 10b—Town Improvement.....	2
Hort. 5—Plant Propagation.....	5
Rhet. 2—Rhetoric and Themes.....	3
Arch. 32—Architectural Drawing.....	4
Mil. 1—Drill Regulations.....	1
Mil. 2b—Military Drill.....	1
P. T. 2—Gymnasium.....	1
Total	17

SECOND YEAR

Prescribed Subjects

Hort. 21a—Landscape Design	4
Hort. 31—Garden Flowers.....	3
C. E. 31—Surveying.....	3
Arch. 13—History of Architecture.....	2
Mil. 2c—Military Drill.....	1
Botany 4d—Taxonomy.....	3
Total	16

Electives

Art and Des. 12—Theory and Practise... 2
--

Prescribed Subjects

Hort. 21b—Landscape Design.....	4
Hort. 24a—Trees and Shrubs.....	3
C. E. 32—Surveying.....	3
Arch. 14—History of Architecture.....	2
Mil. 2d—Military Drill.....	1
Total	13

Electives

Zoology 16—Field Ornithology.....	2
Ent. 4b—Introductory Economic Entomology	3
Hort. 2—Small Fruits	2
Geology 12.....	5

THIRD YEAR

Prescribed Subjects

Hort. 23a—Landscape Design.....	4
Hort. 24b—Trees and Shrubs.....	3
Hort. 27a—Landscape Practise.....	3
Arch. 15—History of Architecture.....	2
Total	12

Prescribed Subjects

Hort. 23b—Landscape Design.....	4
Hort. 26a—Planting Design.....	3
Hort. 27b—Landscape Practise.....	3
Hort. 36—Landscape Reading.....	2
Hort. 41—Civic Design (Elementary Course)	1
Arch. 16—History of Architecture.....	2
Total	15

Electives

Hort. 8—Fruit Culture.....	5
Hort. 29a—Garden Design.....	3
Art and Des. 13—History and Practise....	2
Econ. 2—Principles of Economics.....	2
Sociol. 1—Principles of Sociology.....	3

Electives

Hort. 7—Spraying	3
Hort. 9—Forestry	2
Hort. 29b—Garden Design.....	3
Botany 20—Plant Diseases.....	3
Art and Design 8—Modeling	2
Rhetoric 17—Advanced Composition.....	3
Sociology 7—The Rural Community.....	2

FOURTH YEAR

Prescribed Subjects

Hort. 25a—Landscape Design.....	5
Hort. 26b—Planting Design.....	3
Hort. 37a—Civic Design.....	3
Hort. 38 —Office Practise.....	2
C. E. 55—Roads and Pavements.....	2

Prescribed Subjects

Hort. 25b—Landscape Design.....	5
Hort. 28—Exotics	1
Hort. 37b—Civic Design.....	3

Total15

Total9

Electives

Hort. 25a—Extra Hours.....	3
Hort. 40a—Trees and Shrubs (Advanced Course).....	3
Art and Design 4—Water Color	2
Sociology 10—Population	3
Pol. Sci. 4—Municipal Government.....	3

Electives

Hort. 15 —Plant Growing.....	5
Hort. 40b—Trees and Shrubs (Adv. Course)	3
Hort. 25b—Extra Hours.....	

General Electives

Horticulture 19.....	3
*Horticulture 39	1-8
Zoology 1b.....	2

Modern Language.....	8
Chem. 1 or 1a.....	5 or 3
Physics	10

General Course for Prospective Teachers of Agriculture

A general course is offered for prospective teachers of agriculture. Among the subjects recommended are the following:

Agronomy 2, 9, 12, 25, 26; Animal Husbandry, 1a, 2a, 4a, 5, 11a, 11b, 30†; Dairy Husbandry 2, 3; Horticulture 1a, 1b, 3, 5, 10a, 19; Agricultural Extension, 1, 4-5; Botany 1, 12; Chemistry 1, 2a, 13a; Entomology 4a-4b; Zoology 1; English 20; Rhetoric 1-2, 19; Public Speaking 5-6, 7-8; Economics 2; Education 1, 6; Library Science 12; Military 1, 2a-2b, 2c-2d; Physical Training 1-2, 1a; foreign language.

General Course in Household Science

Of the 130 hours required for graduation, 88 are provided for in the prescribed list and the restricted electives of List A. The other 42 hours of credit necessary for graduation may be taken, subject to the approval of the Dean of the College, from any courses offered in the University. Holders of scholarships in household science in this College take the course as laid out here. Variations from it can be made only by special permission of the Council of Administration on recommendation of the faculty of the College.

*Students taking the professional course are required to register in Horticulture 39 each semester.

†Students taking the Teachers' course may take Animal Husbandry 30 for one-half semester and receive 2½ credits therefor.

College of Agriculture

PRESCRIBED SUBJECTS

Required for the Degree of Bachelor of Science in General Course in Household Science

	Hours
Art and Design 1, 12, 19, 20.....	9
Bacteriology 5	5
Botany 1 or Zoology 1.....	5
Chemistry, 1, 2a.....	10
English 1, 2	8
Household Science 1, 2, 3, 5, 6, 7, 10, 12, 13.....	22
History 1a-1b, or 3a-3b.....	6 or 8
Physiology 4a or 4b.....	5
Physical Training 7a-7b, 9.....	3
Rhetoric 1, 2.....	6
Economics 2	3
Public Speaking 1 or 2.....	2
*List A, a minimum of 4 hours.....	4
Total required subjects	88 to 90
Electives	42 to 40
<i>Total</i>	130

ELECTIVES

List A—English 21, 22, 23, 24
 Horticulture 1a, 1b, 2, 3, 5, 19, 28, 10a
 Household Science 14, 17, 18
 Economics 22, 26
 Sociology 1
 Physics 7a, 8a
 Education 1, 2, 10
 Agronomy 7, 9, 12, 25, 26
 Animal Husbandry 10, 5
 Dairy Husbandry 1, 3, 19, 11, 4
 Agricultural Extension 1, 3, 4

Suggested Course of Instruction

FIRST YEAR

FIRST SEMESTER

SECOND SEMESTER

Hours	Hours
H. Sci. 2—Home Arch. and Sanitation.... 2	Chem. 2a—Inorg. Chem. and Qual. Anal.. 5
Chem. 1 or 1a—Inorganic Chemistry..5 or 3	Rhet. 2—Rhetoric and Themes..... 3
Rhet. 1—Rhetoric and Themes..... 3	†H. Sci. 1—Sel. and Prep. of Food..... 3
A. & D. 1—Freehand Drawing..... 3	Lib'y 12—General Reference..... 2
P. T. 7—Gymnasium Practise..... 1	P. T. 7—Gymnasium..... 1
P. T. 9—Hygiene..... 1	H. Sci. 7—Textiles..... 2

*If physics has not been offered for entrance, its equivalent should be elected.

†Attention is called to the fact that high school physics is a prerequisite for Household Science 1.

SECOND YEAR

Bot. or Zool. 1.....	5	Physiol. 4—Minor Course.....	5
Eng. 1—Survey of Eng. Lit.....	5	Eng. 2—Survey of Eng. Lit.....	4
Econ. 26—Economic Resources.....	3	A. & D. 12—Applied Design.....	2
H. Sci. 6—Econ. Uses of Food.....	3	Econ. 22—Econ. Hist. of U. S.....	3
Hort. 19—Amateur Floriculture.....	3	Electives	

THIRD YEAR

H. Sci. 5—Dietetics.....	3	A. & D. 20—History of Fine Arts.....	2
A. & D. 19—History of Fine Arts.....	2	Econ. 2—Principles of Econ.....	3
Eng. 23—Intro. to Shakespeare.....	3	H. Sci. 3—Home Decoration.....	2
Hist. 1a or Hist. 3a.....	4 or 3	H. Sci. 12—Household Art and Clothing... 2	
Pub. Sp. 1—Oral Expression.....	2	Bact. 5—Intro. Bacteriology.....	5
Electives		Electives	

FOURTH YEAR

H. Sci. 13—Hist. of Home Economics....	2	H. Sci. 11—Teachers' Course.....	3
Sociol. 1—Principles of Soc.	3	Edu. 10—Observation and Technique.....	3
Edu. 1—Intro. to Education.....	4	H. Sci. 10—Home Management.....	2
H. Sci. 18—Lunch Room Management....	5	H. Sci. 17—Study of Textiles.....	3
Electives		Electives	

THE SCHOOL OF MUSIC

Music students should read the General Directions for Registration given in paragraphs 1-28 on pages 9-15. Having secured their study-lists (see paragraphs 1-6, pages 9, 10), they should report to their advisers in Room 202, University Hall.

Each student should follow, *point by point*, the directions given on the first coupon of his or her study-list.

Each student must report to the Chapel, 218 University Hall, to secure approval of sections chosen, in sectional courses (other than courses in music), and to make out class cards and pay the fees.

Practise pianos in the Woman's Building may be secured at the rate of \$3 per semester for one hour a day.

Choral, orchestral, or ensemble work is required of all students who are sufficiently advanced.

All music students are required to attend the concerts and recitals which are given under the auspices of the School of Music.

Public performance being part of the course of study in a practical subject, all students are required to participate in a program when sufficiently prepared.

Students, who by reason of deficient musical ability, inattention, or other valid reason, fail to make satisfactory progress, may be dropped from the classes.

The courses of study in piano, voice, organ, and stringed instruments are planned with the idea that four hours' preparation a day will be spent upon the lessons, to complete the courses in the specified time.

REQUIREMENTS FOR GRADUATION

Candidates for the degree of Bachelor of Music must offer credit for 130 semester hours, including the prescribed subjects named below, together with an acceptable thesis on a topic related to music.

FIRST SEMESTER		FIRST YEAR		SECOND SEMESTER	
	Hours				Hours
Music 3—Harmony.....	2	Music 4—Harmony.....	2	Music 4—Harmony.....	2
Music, 42a, 52a, 62a or 81—Piano, Voice, Violin or Organ.....	6	Music 42b, 52b, 62b or 82—Piano, Voice, Violin or Organ.....	6	Music 42b, 52b, 62b or 82—Piano, Voice, Violin or Organ.....	6
Music 21a—Ear Training.....	3	Music 21b—Ear Training.....	3	Music 21b—Ear Training.....	3
*Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Foreign language, French, German, or Italian.....	4	Foreign language, French, German or Italian.....	4	Foreign language, French, German or Italian.....	4
Phys. Tr. 7a—Gymnasium (women).....	1	Phys. Tr. 7b—Gymnasium (women).....	1	Phys. Tr. 7b—Gymnasium (women).....	1
Phys. Tr. 9—Hygiene (women).....	1	Phys. Tr. 2 —Gymnasium (men).....	1	Phys. Tr. 2 —Gymnasium (men).....	1
Phys. Tr. 1 —Gymnasium (men).....	1	Mil. 2b—Drill (men).....	1	Mil. 2b—Drill (men).....	1
Phys. Tr. 1a—Hygiene (men).....	1	Mil. 1 —Drill Regulations (men).....	1	Mil. 1 —Drill Regulations (men).....	1
Mil. 2a—Drill (men).....	1				
<hr/>		<hr/>		<hr/>	
Total, Men.....	17	Total, Men.....	18	Total, Men.....	18
Total, Women.....	17	Total, Women.....	16	Total, Women.....	16

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See page 12.

SECOND YEAR

Music 1—History of Music.....	2	Music 2—History of Music.....	2
Music 5—Advanced Harmony.....	3	Music 6—Advanced Harmony.....	3
Music 43a, 53a, 63a or 84—Piano, Voice, Violin or Organ.....	6	Music 43b, 53b, 63b or 85—Piano, Voice, Violin or Organ.....	6
Music 22a—Ear Training.....	1	Music 22b—Ear Training.....	1
Music 23a—Sight Singing.....	1	Music 23b—Sight Singing.....	1
Foreign language, French, German or Italian	4	Foreign language, French, German or Italian	4
Mil. 2c—Drill (men).....	1	Mil. 2d—Drill (men).....	1
<hr/>		<hr/>	
Total, Men.....	17	Total, Men.....	17
Total, Women.....	16	Total, Women.....	16

THIRD YEAR

Music 7—Counterpoint, Canon and Fugue. 3	Music 8—Counterpoint, Canon and Fugue. 3
Music 44a, 54a, 64a or 86—Piano, Voice, Violin or Organ.....	Music 44b, 54b, 64b or 87—Piano, Voice, Violin or Organ.....
Music 24a—Sight Singing.....	Music 24b—Sight Singing.....
Education 1—Principles.....	English 2—Survey of English Literature..
English 1—Survey of English Literature..	Music 46a, 56a, 66a, 83a—Minor Subject..
<hr/>	<hr/>
Total	Total

FOURTH YEAR

Music 9—General Theory, Free Composition	Music 10—General Theory, Free Composi-
Music 11—Acoustics	tion
Music 45a, 55a, 65a or 88—Piano, Voice, Violin or Organ.....	Music 45b, 55b, 65b or 89—Piano, Voice, Violin or Organ.....
Music 46b, 56b, 66b, 83b—Minor Subject..	Music 46c, 56c, 66c, 83c—Minor Subject..
Music 94a—Recital	Music 94b—Recital
English 35—The English Drama.....	Music 12—Acoustics
Music 27a—Ensemble.....	Music 27b—Ensemble
<hr/>	<hr/>
Total	Total

In addition, for Women: Electives, to make up the prescribed total of 130 hours. These extra credits may be taken at any time; the election made must be approved by the student's adviser.

Courses 42a-42b to 88-89, include regular attendance in Music 91a-91b (Orchestra), Music 93a-93b (Choral Society), and Music 94a-94b (Recital), unless a student is excused by the Director of the School of Music.

COURSE IN PUBLIC SCHOOL MUSIC

The aim of the Course in Public School Music is to prepare competent teachers and supervisors of music for the public schools. Students completing the course are granted teachers' certificates. An opportunity for practise teaching is offered. The course is one year in length, and comprises the following prescribed subjects:

Music 1-2—History of Music.....	4 hours
Music 3-4—Harmony	4 hours
Music 21a-21b—Ear Training.....	2 hours
Music 23a-23b—Sight Singing.....	2 hours
Music 25a-25b—Methods of Teaching.....	8 hours
Practical Music, major, Piano or Voice (42a-42b or 52a-52b).....	12 hours
Practical Music, minor, Voice or Piano (56a-56b or 46a-46b).....	4 hours
<i>Total</i>	36 hours

Advanced students may satisfy a part of the foregoing requirements by examination; in no case, however, is a student permitted to take less than 30 hours of work.

THE COLLEGE OF LAW

Law students should read the General Directions given in paragraphs 1-28 on pages 9-15. Having secured their study-lists (see paragraphs 1-6, pages 9, 10), they should report to their advisers in Room 206, Law Building.

Each student should follow, *point by point*, the directions given on the first coupon of his study-list.

REQUIREMENTS FOR GRADUATION AND DEGREES

The degree of Bachelor of Laws will be granted to all regularly matriculated students who complete all the courses in the first year list; courses 11 and 12 second year; and enough of the other courses offered to make 84 hours of credit.

Degree of Doctor of Law

The degree of Doctor of Law (J.D.) will be granted to students who comply with the following conditions:

1. Complete the work required for the degree of Bachelor of Laws.
2. Secure a bachelor's degree in arts or science at least two academic years prior to the completion of the course for the degree of Bachelor of Laws.
3. Obtain a minimum average grade of 85 in the College of Law.
4. Present a thesis approved by the faculty of the College of Law, in accordance with the requirement hereinafter set out.

Students who receive the A.B. degree after registering in the College of Law, and, by counting courses in law toward both the degree of A.B. and the degree of LL.B., take both degrees in six years, must during the first year in the College of Law take four hours in history or the social sciences.

Rules Concerning Theses

The rules concerning theses presented for the degree of Doctor of Law are as follows: 1. The thesis must be on a subject approved by the Dean of the College of Law after consultation with him as to the proposed method of treatment. 2. The subject of the thesis must be filed with the Secretary on or before December 20. 3. The thesis must be typewritten on paper 8½x11 inches, with at least one inch margin at the top, bottom, and sides. 4. It should contain not less than 4,000 nor more than 10,000 words. 5. In citing cases, names of parties, volume, page, and year should be given. Citations are not to be counted in determining the number of words. The student is expected to exhaust the cases decided during the period covered by his thesis, and to state the period for which the cases have been examined. 6. The thesis must be delivered to the Secretary of the faculty not later than May 1.

The thesis may then be returned to the writer for revision, or if unsatisfactory, it may be rejected altogether. If returned for revision it may be rejected after being revised. If accepted, it will be filed in the Law Library, and may be published by the College of Law or by the University.

COURSE LEADING TO THE DEGREE OF LL. B.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Law 1a—Contracts	3	Law 1b—Contracts	3
Law 2a—Torts	3	Law 2b—Torts	3
Law 5 —Criminal Law.....	4	Law 3 —Real Property.....	3
Law 6 —Personal Property.....	2	Law 7 —Domestic Relations.....	2

SECOND YEAR OR THIRD YEAR

Law 9—Sales	3	Law 10 —Real Property.....	4
Law 11 —Agency	3	Law 18 —Wills	2
Law 12a—Equity	3	Law 20 —Equity Pleading.....	2
Law 35a—Brief Making.....	1	Law 35b—Moot Court.....	1
Law 13 —Damages	2	Law 14 —Carriers	3
Law 15 —Bills and Notes.....	3	Law 19 —Partnership	2
Law 30 —Public International Law.....	3	Law 24 —Municipal Corporations.....	2
Law 23 —Insurance	2	Law 27 —Future Interests in Property....	3
		Law 32 —Quasi-Contracts	2
		Law 34 —Public Utilities.....	2

THIRD YEAR

Law 4a—Illinois Procedure.....	3	Law 17 —Private Corporations.....	2
Law 22—Constitutional Law.....	3	Law 21 —Suretyship	3
Law 36a—Moot Court.....	2	Law 33 —Constitutional Law.....	2
Law 23 —Mortgages	2	Law 36b—Moot Court.....	2
Law 25 —Bankruptcy	2	Law 31 —Conflict of Laws.....	2

SUGGESTED TWO YEAR COURSE IN PREPARATION FOR LAW

The following schedule of studies is recommended by the faculty of the College of Law for students taking two years in the College of Liberal Arts and Sciences to meet the requirements for admission to the College of Law.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Military 2a.....	1	Military 1 and 2b.....	2
Physical Training 1 and 1a.....	1	Physical Training 2.....	1
Rhetoric 1.....	3	Rhetoric 2.....	3
Foreign Language.....	4	Foreign Language.....	4
History 2a.....	3	History 2b.....	3
Science	5	Mathematics 2.....	3
Total	17	Total	16

SECOND YEAR

Military 2c.....	1	Military 2d.....	1
Science or foreign language.....	5 or 4	English 20.....	4
Political Science 1.....	3	Political Science 3.....	3
Economics 1.....	5	Economics 3.....	3
History 4a.....	3	Philosophy 1.....	3
		History 4b.....	3
Total	17 or 16	Total	17

The courses in military and physical training. Rhetoric 1-2, and eight hours in foreign language are required of freshmen in the College of Liberal Arts and Sciences. Latin is strongly urged for all students intending to study law; but those who have not had the necessary preparation for college courses in Latin should substitute a modern language, preferably French or German.

SCHOLARSHIP PRIZES

Eight scholarship prizes are open to matriculated students of the first and second years, to be awarded at the end of each year, four of \$50 each and four of \$25 each, available in discharge of tuition fees.

The American Law Book Company of New York offers an annual prize consisting of the Students' Edition of CYC, to be awarded to the member of the senior class making the best average during his senior year.

Callaghan & Company, law publishers, of Chicago, offer an annual prize consisting of the Cyclopedic Law Dictionary to be awarded to the member of the second-year class making the best average during his second year.

COMBINED SIX YEAR COURSE IN LIBERAL ARTS AND SCIENCES AND LAW

A student who has senior standing in the College of Liberal Arts and Sciences may take the first year courses in law and obtain 30 hours credit toward the degree of Bachelor of Arts and 28 hours toward the degree of Bachelor of Laws. Students registered in the College of Law may also count 6 hours toward both degrees for six hours of work offered by the College of Liberal Arts and Sciences in jurisprudence, international law, and administrative law.

THE LIBRARY SCHOOL

Library students should present themselves in Room 320, Library Building, where both their admission and their registration may be completed.

SCHEDULE OF COURSE

The course is two years in length. For graduation a student must receive credit for all courses except those marked with an asterisk (*), which are elective. The degree of Bachelor of Library Science is conferred on a student who has completed the required work in the two years' course, and has received credit in courses amounting to 65 hours.

JUNIOR YEAR

FIRST SEMESTER

- 2a¹—Reference work (3 hrs.)
- 3a—Selection of books (2 hrs.)
- 4a—Practise Work, 4 hours per week (2 hrs.)
- 16 —Order, accession and shelf work (2 hrs.)
- 17 —Classification and book numbers (3 hrs.)
- 18 —Cataloging (3 hrs.)
- 23a—Library administration and current library literature (1 hr.)

SECOND SEMESTER

- 2b¹—Reference work (3 hrs.)
- 3b—Selection of books (2 hrs.)
- 4b—Practise work, 4 hours per week (2 hrs.)
- 7 —History of libraries (2 hrs.)
- 19 —Trade bibliography (1 hr.)
- 20 —Loan department (1 hr.)
- 21 —Printing, binding, indexing (2 hrs.)
- 22 —Library extension (3 hrs.)
- 23b—Library administration and current library literature (1 hr.)

SENIOR YEAR

- 6a—Subject bibliography (2 hrs.)
- 8 —*Advanced reference work (2 hrs.)
- 10a—Practise work, 8 hours per week (4 hrs.)
- 13a—Public documents (2 hrs.)
- 15a—Seminar (2 hrs.)
- 24a—Selection of books (2 hrs.)
- 26a—Library administration (3 hrs.)
- 27 —Bibliographical institutions (1 hr.)

- 6b—Subject bibliography (2 hrs.)
- 9 —Bookmaking (2 hrs.)
- 10b—Practise work, 8 hours per week (4 hrs.)
- 13b—*Public documents (2 hrs.)
- 15b—Seminar (2 hrs.)
- 24b—Selection of books (2 hrs.)
- 25 —Advanced classification and cataloging (1 hr.)
- 26b—Library administration (3 hrs.)
- 28 —*Practise work in various departments of the library (1 to 4 hrs.)

RECOMMENDED PRELIMINARY COURSE

Undergraduates who intend, on the completion of their college work, to apply for admission to the Library School, are requested to select their courses so as to conform in general to the following recommended program of studies preparatory to library work:

Recommended Preliminary Course

- English literature, 5²; rhetoric, 2.
- Latin, 4, in addition to four years of high school Latin.
- German, 6, in addition to two years of high school German.
- French, 4, in addition to two years of high school French.

¹The numbers in these columns refer to the Courses in Library Science in the General Description of Courses.

²The figures after each subject indicate the minimum number of lecture or recitation hours a week which the student should devote to that subject throughout one college year.

Languages begun in college instead of in the high school should be continued for a longer period.

Medieval and modern European history, 3; history of England, 3; history of the United States, 3.

Economics, 3; political science, 2; sociology, 3.

Philosophy, 2; general psychology, 2.

Zoology, 3; botany, 2; chemistry or physics, 3.

The total of this work is 100 semester hours, leaving the equivalent of one year of a four-year course free for work in other subjects or for more work in the subjects named.

PREPARATION FOR SPECIAL LIBRARIES

Seniors who desire to prepare themselves for work in special libraries (e. g. normal school, historical, business, agricultural) may, with the approval of the faculty, substitute certain advanced courses in other colleges and schools of the University for certain Library School courses.

LIBRARY VISITS AND FIELD WORK

Each year all the students in the School are required to visit the libraries and certain of the book binderies, book stores, and printing establishments of either Chicago and vicinity or St. Louis and vicinity. During this visit, which occupies one week, the students are accompanied by a member of the faculty. The expense of this week is about \$20.

In order to assure a varied library experience, each student in the senior year is required to spend one month in an assigned library, working, as far as practicable, under the same conditions as a member of the staff of that library. The expense of this month is about \$40.

THE SCHOOL OF EDUCATION

GENERAL STATEMENT

The School of Education was established in 1905 as an organization of the various activities of the University which are concerned with the professional preparation of teachers and supervisors for the public schools. The nucleus of the School is the department of education in the College of Liberal Arts and Sciences. The faculty of the School is made up of the members of this department and of other departments who offer courses intended for the preparation of high-school teachers. The Board of Trustees has approved plans for a building to be used as a laboratory for the School of Education and to include quarters for a training school of secondary grade, and has purchased a site upon which the first wing of this building will be erected.

COMMITTEE ON APPOINTMENT OF TEACHERS

The Committee on Appointment of Teachers recommends qualified graduates of the University for positions as teachers or supervisors in public schools, colleges, and technical schools in response to requests from the school authorities. The Director of the School of Education is chairman of the Committee, and the Secretary of the School is its chief executive officer.

The recommendations of the Committee are made under the following regulations, which were adopted by the University Senate on June 3, 1912:

1. The University Committee on Appointments is authorized to issue its recommendation, signed by the committee as the agent of the University, in all cases in which it is satisfied with the students scholarship and ability to teach. The Committee shall regard the scholarship requirements as met if, in addition to carrying the professional courses mentioned in the next paragraph, the student has passed with an average grade of 85 in the courses necessary to constitute a major in the principal subject which he wishes to teach, and in courses aggregating a minimum varying from six to twelve semester hours (according to subject, and at the discretion of the Committee) in each of the other subjects for which he wishes to be recommended. The Committee shall, however, in each case secure the written opinion of the departments concerned in regard to the scholarship of the applicant, and shall view the evidence of scholarship as shown by the records in the light of this opinion; and if there appear to the Committee to be reasons which from their nature cannot be shown by mere records for questioning the scholastic ability of the student, the Committee may in its discretion withhold the recommendation.

2. A candidate must have successfully completed the following courses in the department of education:

- a. An introductory course which shall aim (1) to acquaint the prospective teacher with the public-school system as it exists today in the United States, and (2) to present a brief outline of the principles of education. (A four-hour course.)

- b. A course in the technique of teaching, accompanied by observation of class-room work in secondary schools, and including a discussion of class-management (routine and discipline), the elements of school hygiene, and the types of school exercises. (A three-hour course.)

3. The Director of the School of Education may, in his discretion, excuse a candidate from the professional courses outlined above, (1) if the candidate is a normal-school graduate or has taken equivalent courses in a normal school or in another college or university; or (2) if the candidate has had at least one year of successful teaching experience. If, at the time of registration with the Committee on Appointments, the candidate has not completed one of the required courses, but is enrolled at that time in the course, a Committee recommendation may be given with the approval of the instructor in charge of the course.

The courses mentioned in Section 2 are (a) Education 1, Introduction to Education (4 hours), and (b) Education 10, Observation and Technique of Teaching (3 hours). Either course may be taken in either semester.

THE SCHOOL OF RAILWAY ENGINEERING AND ADMINISTRATION

GENERAL STATEMENT

The School of Railway Engineering and Administration has been established to prepare men broadly for the technical and administrative departments of railroads. The work offered is arranged in five different courses, any one of which is designed to occupy four years' time. The courses are:

- Railway Civil Engineering
- Railway Mechanical Engineering
- Railway Electrical Engineering
- Railway Transportation
- Railway Administration

The first three of these courses are administered by the College of Engineering, and a description of them appears with that of other courses offered by this College. Students are admitted to them under the same conditions as to other courses of the College of Engineering, and they have available for their use all of the library, drafting-room, and laboratory facilities which constitute the equipment of this College. The last two courses are administered by the College of Commerce and Business Administration; they are described in detail in connection with the other courses of this College. Students are admitted to them under the same conditions as to other courses of the College of Commerce and Business Administration.

It is the purpose of each of these courses to add to the broad foundation of discipline and training which should be supplied by every college course such specialized training as will be most useful to those who look forward to careers in railway service.



DESCRIPTION OF COURSES

EXPLANATION

The arrangement of subjects in the following Description of Courses is alphabetical. The connections of allied departments are indicated by cross references.

Following the description of each course of instruction will be found the requirements, if any, for admission to that particular course. The sequence indicated by these prerequisites must be followed. For instance, under Art and Design 5, Painting, the prerequisites given are Art and Design 1, 2, and 3. These three courses must be completed before Course 5 may be taken.

If a course not required for graduation is selected by fewer than five students it may be withdrawn for the semester.

Graduate courses are numbered upward from 100.

Credit is reckoned in *semester hours*, or simply *hours*. An *hour* is one class period a week for one semester, or the equivalent in laboratory, shop, or drawing room. Graduate work is not recorded in credit hours, nor do the credit hours of undergraduate courses apply to graduate students enrolled in them.

The semester, and the number of *hours* each semester for which the course counts, are shown after each course, thus: *I, II; (2)*. The Roman figures indicate semesters; the Arabic numerals in parenthesis indicate *hours* of credit for *each semester* for undergraduates. The omission of a course for the current year is indicated by enclosing the entire description of such a course in brackets.

The various University buildings are designated by the following abbreviations:

Agricultural Building.....Ag.	Lincoln Hall.....L.H.
Applied Mechanics Laboratory.....L.A.M.	Mechanical Engineering Laboratory....M.L.
Astronomical Observatory.....Obs.	Metal Shops.....M.S.
Ceramics Laboratory.....Cer.	Mining Engineering Laboratory.....Min.L.
Chemistry Building.....Ch.	Natural History Hall.....N.H.
Commerce Building.....Com.	Physics Laboratory.....P.L.
Electrical Engineering Laboratory.....E.L.	Stock Judging Pavilion.....S.P.
Engineering Hall.....E.H.	Transportation Building.....T.B.
Farm Mechanics Building.....F.M.	University Hall.....U.H.
Floricultural Greenhouses.....F.G.	Vegetable Greenhouse.....V.G.
Horticultural Building.....H.B.	Woman's Building.....W.B.
Library.....L.	Wood Shops.....W.S.

ACCOUNTANCY

(See BUSINESS ORGANIZATION and OPERATION.)

AGRICULTURAL EXTENSION

FRED HENRY RANKIN, *Superintendent and Assistant to the Dean, with rank of Assistant Professor*

ARETAS WILBUR NOLAN, M.S., *Assistant Professor*

ALBERT WOODWARD JAMISON, M.S., *Assistant Professor*

JOSEPH HARVEY CHECKLEY, B.S., *Assistant*

ROBERT ENOCH HIERONYMUS, M.A., LL.D., *Community Adviser*

JAMES HENRY GREENE, M.S., *State Leader, Junior Extension*

1. **Principles and Methods of High School Agriculture.**—Adaptation of agricultural science and practise to high school conditions; order and methods of presentation; laboratory work; apparatus; field work. Practise teaching provided through co-operation with the local high school. *II; (5)*.

Prerequisite: Two years' work in agriculture.

Agronomy

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	1	5	—	3	3	3	3	3	—	Ag.	Nolan

3. Agricultural Extension Teachings.—The service of extension enterprises to the people; farmers' institutes; agricultural extension schools; farmers' clubs and co-operative work in rural communities. *II*; (1).

Prerequisite: Agricultural Extension 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	3	1	—	—	—	3	—	—	—	Ag.	Rankin Jamison

4. Country Life Problems.—Problems of the farm; duties of citizenship; social, economic, and educational work in rural communities. Lectures. Required of first-year students. *I*; (1).

(Credit given to agricultural freshmen only.)

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	4	1	—	3	—	3	—	—	—	Morrow Hall	Davenport and others

AGRONOMY

CYRIL GEORGE HOPKINS, Ph.D., *Professor, Agronomy*
 LOUIE HENRIE SMITH, Ph.D., *Professor, Plant Breeding*
 JEREMIAH GEORGE MOSIER, B.S., *Professor, Soil Physics*
 WILLIAM LEONIDAS BURLISON, Ph.D., *Associate Professor, Crop Production*
 ROBERT STEWART, Ph.D., *Associate Professor, Soil Fertility*
 AXEL FERDINAND GUSTAFSON, M.S., *Assistant Professor, Soil Physics*
 IRA WILMER DICKERSON, B.S., *Associate, Farm Mechanics*
 KARL JOHN THEODORE EKBLAW, B.S., *Associate, Farm Mechanics*
 FREDERICK CHARLES BAUER, B.S., *Associate, Soil Fertility*
 ALBERT LEMUEL WHITING, Ph.D., *Associate, Soil Fertility*
 CHESTER OTIS REED, B.S., *Instructor, Farm Mechanics*
 FORREST ADDISON FISHER, B.S., *Instructor, Soil Physics*
 MARVIN EDWARD JAHR, A.B., *Instructor, Farm Mechanics*
 ORR MILTON ALLYN, B.S., *Instructor, Crop Production*
 ELMER TRYON EBERSOL, M.S., *Instructor, Crop Production*
 CLYDE ROSS NEWELL, M.S., *Instructor, Farm Mechanics*
 HARRY CHARLES GILKERSON, B.S., *Assistant, Soil Fertility*
 HARRISON FRED THEODORE FAHRNKOPF, B.S., *Assistant, Soil Fertility*
 HOWARD JOHN SNIDER, B.S., *Assistant Soil Fertility*
 WARREN RIPPEY SCHOONOVER, B.S., *Assistant, Soil Fertility*
 EDWARD HARVEY WALWORTH, B.S., *Assistant, Crop Production*
 FRANK ARCHIBALD WYATT, Ph.D., *Assistant, Soil Fertility*
 FRIEDEL CHAPIN RICHEY, B.S., *Assistant, Soil Physics*
 ALFRED THORPE MORISON, B.S., *Assistant, Crop Production*

1. Drainage.—Drainage and its surveying operations. Chaining, mapping, leveling, designing, setting grade stakes, laying tile. Lectures and laboratory first half semester; field work second half semester. *II*; (3).

Prerequisite: Agronomy 9 (Soil Physics), or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	1	3	—	10,11	—	10,11	—	10,11	—	201 F. M.	Jahr

2. Field Machinery.—Construction, principles of operation, adjustment, purchase, and care of implements for soil, seed, and feed preparation, and for seeding, cultivating, harvesting, and handling farm crops. Whiffle-trees and hitches. Lectures; laboratory; practise in troubles, adjustments, testing, and study of farm power machines. *I*; (3).

Prerequisite: Agronomy 26 or registration therein, except for seniors.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	2	3	*A, Lecture	—	—	—	—	8	—	F. M.	Reed
			Laboratory	8,9	—	8,9	—	—	—		
			Quiz	—	—	—	—	9	—		
			*B, Lecture	—	—	—	—	8	—		
			Laboratory	—	1,2	—	1,2	—	—		
			Quiz	—	3	—	—	—	—		
			*C, Lecture	1	—	—	—	—	—		
			Laboratory	—	—	1,2	—	1,2	—		
			Quiz	2	—	—	—	—	—		
			*D, Lecture	1	—	—	—	—	—		
			Laboratory	—	8,9	—	8,9	—	—		
			Quiz	—	—	—	—	—	11		

* Sections A and B are for students who have had farm experience equivalent to at least two full years of four consecutive seasons each; sections C and D are for students who have not had the above experience.

3. Farm Power Machinery.—The horse as a motor, windmills, water-power, steam engines, hot-air engines, electric motors—their theory, operation, and economy. Internal combustion engines and tractors—methods of ignition, theory, operation, and economy. Transmission of farm power and its application to farm operation. Lectures; laboratory. (Alternating with Mechanical Engineering 71 and 73 if desired.) *II*; (3).

Prerequisite: Agronomy 26 or registration therein, except for seniors.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	3	3	A	—	8,9	8,9	—	8,9	—	201 F. M.	Dickerson
			B	8,9	8,9	—	8,9	—	—	201 F. M.	Dickerson
			C	1,2	—	1,2	—	1,2	—	201 F. M.	Dickerson

4. Farm Buildings.—Construction materials; construction, arrangement, design, and cost estimation of machine sheds, granaries, cribs, silos, poultry houses, swine houses, various types of barns, and farm residences. Recitations and drafting. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	4	3	—	1,2	—	1,2	—	1,2	—	205 F. M.	Eckblaw

7. Advanced Farm Crops.—History and utility of each crop; its place in systems of farming; rotations, distribution of labor, cost of production, consumption of products and by-products, storage and marketing. Lectures, assigned reading, laboratory; demonstrations. The schedule is so arranged that this course may be taken in conjunction with Agronomy 22 (Plant Breeding) and students are advised to register for both courses. *II*; (3).

Prerequisite: Agronomy 25.

Agronomy

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	7	3	—	—	1,2	—	1,2	1,2	—	Ag.	Burlison

8. Special Farm Crops.—Special crops in which the student is interested. Reading; experiments by pot culture in the greenhouse or by plots in the field. Under special arrangement part of this work may be done during summer vacation. *II*; *(2 to 5).

Prerequisite: Agronomy 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	8	*2 to 5	—	—	—	—	—	—	—	(Arrange)	Burlison

9. Soil Physics and Management.—Origin and formation of soil material; mechanical composition and classification; moisture; texture as affecting capillarity, osmosis, diffusion, temperature, aeration, and as affected by plowing, harrowing, cultivating, rolling, and cropping; wasting by washing, fall or spring plowing and drainage as affecting moisture, temperature, and root development; real and apparent specific gravity, porosity, water holding capacity, and capillary power; the physical effects of different systems of rotation and of continuous cropping with various crops. Lectures; laboratory. *I* or *II*; (5).

Prerequisite: Chemistry 2 and 3, one unit in entrance physics, and one year of university work. Regular students should take Chemistry 13a previous to this course, others consult instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	9	5	A, Lecture	8	8	8	—	—	—	701 Ag.	Mosier
			A, Quiz	9	—	—	—	—	—		Gustafson
			A, Lab.	—	9	9	8,9	8,9	—	650 Ag.	Fisher
			B, Lecture	10	10	10	—	—	—	701 Ag.	Richey
			B, Quiz	11	—	—	—	—	—		Mosier
			B, Lab.	—	11	11	10,11	10,11	—	650 Ag.	Gustafson

SECOND SEMESTER

Lecture	8	8	8	—	—	—					Mosier
Quiz	9	—	—	—	—	—					Gustafson
Laboratory	—	9	9	8,8	8,9	—	650 Ag.				Fisher
											Richey

10. Special Work in Soil Physics.—Physical properties of special soils; centrifugal analysis; field observations of the effects of discing, harrowing, and rolling; time and depths of cultivation; soil moisture and temperature; effects of washing of soils; methods of prevention. *I* or *II*; *(2-5).

Time to be arranged. Professor MOSIER, Assistant Professor GUSTAFSON, Mr. FISHER.

Prerequisite: Agronomy 9, and approval of the Soil and Physics division.

*In registering for a course with variable credit hours, a student must put down on his study list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

11. Soil Biology.—Quantitative studies of the fertility of the biochemical activities of soil microorganisms; factors influencing the bacteria, protozoa, algae, and fungi; isolation and study of organisms; action on insoluble mineral plant food; fermentation of crop residues, green and farm manures; nitrogen fixation; assimilation and preservation, and similar studies of the other essential elements. Lectures; quiz; laboratory, *II*; (5).

Prerequisite: Agronomy 12 and Bacteriology 5 or Bacteriology 19.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	11	5	Lecture	8	—	8	—	—	—	303 Ag.	Whiting
			Quiz	—	—	—	—	8	—	303 Ag.	Whiting
			Laboratory	1,2	—	1,2	—	1,2	—	321 Ag.	Schoonover

***12. Soil Fertility, Fertilizers, Rotations.**—The influence of fertility upon yield; effect of different crops upon the soil and upon succeeding crops; different rotations; ultimate effect of different systems of farming upon fertility and productivity; composition and value of manures and fertilizers, soils cropped continuously with different crops and with a series of crops; the fertility of soils of different types from different sections of Illinois. Lectures; Laboratory. *II*; (5).

Prerequisite: Chemistry 13a; Agronomy 9.

SECOND SEMESTER												
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Agronomy	12	5	Lecture	—	8	—	8	—	—			Hopkins
			A-1, Quiz	—	9	—	9	—	—		Bauer	
			A-2, Quiz	—	9	—	9	—	—		Wyatt	
			B-1, Quiz	—	—	8	—	8	—		Bauer	
			B-2, Quiz	—	—	8	—	8	—		Snider	
			C-1, Quiz	3	—	3	—	—	—		Wyatt	
			C-2, Quiz	3	—	3	—	—	—		Snider	
												Bauer
			A, Laboratory	8,9	—	8,9	—	8,9	—	218 Ag.	Wyatt	
			B, Laboratory	—	9,10,11	—	9,10,11	—	—	650 Ag.	Snider	
			C, Laboratory	—	1,2,3	—	1,2,3	—	—	218 Ag.	Fahrnkopf	
											Gilkerson	

***12a. Soil Fertility, Fertilizers, Rotations.**—The same as Agronomy 12, for advanced students. Lectures; Quiz. *II*; (2).

Prerequisite: Graduate Standing, or advanced undergraduate standing with the approval of the division.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	12a	2	Lecture	—	8	—	8	—	—		Hopkins
			A-1 Quiz	—	9	—	—	—	—		Wyatt
			A-2 Quiz	—	—	8	—	—	—		Bauer
			A-3 Quiz	3	—	—	—	—	—		Snider

13. Investigation of the Fertility of Special Soils.—Soils in which the student is interested. Nature and quantity of the elements of fertility; effect

* A required inspection trip to certain soil experiment fields or farms will be arranged in May or early June, in connection with courses 12 and 12a, which will require an expense of about \$10 on the part of the student.

Agronomy

of different fertilizers, as determined by pot cultures and by pot experiments; systematic study of similar work of experiment stations and experimenters. *I*; *(2, 3, 4, 5).

Prerequisite: Agronomy 12.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	13	*2,3,4,5	—				(Arrange)		218 Ag.	Stewart Wyatt

16. German Agricultural Readings.—The current numbers of German journals of agricultural science used as texts, with special attention to soils and crops. *II*; (2).

Prerequisite: Two years' work in German; Agronomy 12.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	16	2	—				(Arrange)		214 Ag.	Hopkins

17. Harvesting Machinery.—Expert work on grain binders, corn binders, mowers, hay rakes, loaders, and stackers. (For students preparing to do expert work in the field. Before registering in this course students are requested to consult instructor regarding requirements for experting.) *II*; (3).

Prerequisite: M. E. 81; Agronomy 2, and Agronomy 3, or registration therein.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	17	3	A	—	8,9	—	8,9	—	8,9	F. M.	Reed
			B	—	1,2	—	1,2	—	10,11	F. M.	Reed

18a-18b. Investigation and Thesis.—*I, II*; *(5-10).

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Agronomy	18a	*5 to 10	—					(Arrange)		}	Hopkins
											Mosier
											Smith
											Stewart
SECOND SEMESTER											
Agronomy	18b	*5 to 10	—					(Arrange)		}	Eckblaw

19a-19b. Research Work in Farm Mechanics.—Consult instructor regarding time and requirements. *I, II*; *(1-5).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	19a	*1 to 5	—					(Arrange)		}	Eckblaw
											Dickerson
											Jahr
											Reed
SECOND SEMESTER											
Agronomy	19b	*1 to 5	—					(Arrange)		}	

20. Farm Concrete Construction.—Materials used in concrete construction; mixing and placing; simple comparative tests; specifications and estimates for farm concrete construction. Lectures and laboratory. *II*; (2).

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	20	2	A	—	10,11	—	10,11	—	—	201 F. M.	Ekblaw
			B	—	1,2	—	1,2	—	—	201 F. M.	Ekblaw

22. Plant Breeding.—The improvement by breeding of field crops, including grains, grasses, and legumes; general principles involved, with practical applications. Lectures, assigned reading, demonstrations, and laboratory.

(Schedule is so arranged that this course may be taken in conjunction with Agronomy 7.) *II*; (2).

Prerequisite: Botany 1; Chemistry 13a; Agronomy 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	22	2	—	1,2	—	1,2	—	—	—	Ag.	Smith

23. Plant Food Supplies.—The world's supply of plant-food materials; utilization and conservation. *II*; (1).

Prerequisite: Agronomy 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	23	1	—					(Arrange)		316 Ag.	Stewart

25. Farm Crops.—Plant growth; structure; habits and requirements; preparation of the seed bed; seed selection for productiveness; grading and fanning of grain as a means of improvement; storing; care of stored grain; market grades of grain and grain judging; examination for purity; testing for vitality; weeds, identification, methods of distribution, eradication, control; diseases of farm crops and methods of prevention. *I* or *II*; (4).

NOTE: Students registering in a given lecture section must, if possible, register in the corresponding laboratory section.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	25	4	A, Lecture	2	—	2	—	—	—	701 Ag.	Burlison
			A, Lab.	—	8,9	—	8,9	—	—	600 Ag.	Walworth
			B, Lecture	—	3	—	3	—	—	701 Ag.	Ebersol
			B, Lab.	—	1,2	—	1,2	—	—	600 Ag.	Morrison

26. Elementary Farm Mechanics.—Ropes, soldering, babbitting, belt lacing, pipe cutting, plumbing, sewage disposal, farm water systems, lighting systems, heating systems, power transmission, elementary mechanics, and equalizers. Design of farm power plant. *I* or *II*; (3).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	26	3	A, Quiz	—	8	—	—	3	—	201 F. M.	Ekblaw Newell
			Drafting	—	9	—	—	—	—		
			Laboratory	—	—	—	8,9	—	—		
			B, Quiz	—	—	10	—	10	—		
			Drafting	—	—	—	—	11	—		
			Laboratory	10,11	—	—	—	—	—		
			C, Quiz	2	—	—	—	2	—		
			Drafting	—	—	—	—	1	—		
			Laboratory	—	—	1,2	—	—	—		
			D, Quiz	8	—	—	—	8	—		
			Drafting	9	—	—	—	—	—		
			Laboratory	—	—	8,9	—	—	—		

Agronomy

27. Drainage Design.—Designing tile drainage systems from level note data and contour maps; estimating sizes, amounts, and cost of tile, and cost of system, designing outlet open ditch system for drainage districts, estimating sizes and costs; drainage district laws; preparing bids on contract jobs; advanced field work. *I*; *(1-5).

Prerequisite: Agronomy 1, or C. E. 96, C. E. 31, or C. E. 32.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	27	*1 to 5	—						205 F. M.	Jahr

Courses for Graduates

101. Soil Investigations.—Systems of soil investigations; sources of error and methods of control; interpretation of results. *II*; ($\frac{1}{2}$ to 1 unit.)

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	101	$\frac{1}{2}$ to 1 unit	—						214 Ag.	Stewart

103. Soil History.—Ultimate effect upon the soil of systems of agricultural practise. *II*; ($\frac{1}{2}$ to 1 unit).

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	103	$\frac{1}{2}$ to 1 unit	—						214 Ag.	Hopkins

104. Seminar in Agronomy.—Critical study by graduate students, faculty, and staff members of current literature on the subject of soils and crops. *Once a week, I, II*; ($\frac{1}{2}$ unit).

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	104	$\frac{1}{2}$ unit	—						301 Ag.	Whiting and others

112. Plant Breeding.—A detailed study of experiments at this station; methods and results reported from other states and from foreign countries. *I, II*; ($\frac{1}{2}$ to 2 units).

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	112	$\frac{1}{2}$ to 2 units	—						110 Ag.	Smith

118. Investigation.—*I, II*; (1 to 2 units).

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	118	1 to 2 units	—						Ag.	Hopkins
										Smith
										Stewart
										Mosier
										Whiting

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

ANIMAL HUSBANDRY

(Including FARM MANAGEMENT)

HERBERT WINDSOR MUMFORD, B.S., *Professor, Animal Husbandry*
 HARRY SANDS GRINDLEY, D.Sc., *Professor, Animal Nutrition*
 WALTER CASTELLA COFFEY, M.S., *Professor, Sheep Husbandry*
 HENRY PERLY RUSK, M.S., *Professor, Cattle Husbandry*
 JAMES LLOYD EDMONDS, B.S., *Assistant Professor, Horse Husbandry*
 JOHN A DETLEFSEN, D.Sc., *Assistant Professor, Genetics*
 WALTER FREDERICK HANDSCHIN, B.S., *Assistant Professor, Animal Husbandry*
 DANIEL OTIS BARTO, B.S., *Associate, Poultry Husbandry*
 WALTER EDWARD JOSEPH, Ph.D., *Associate, Animal Husbandry*
 SLEETER BULL, M.S., *Associate, Animal Nutrition*
 HAROLD HANSON MITCHELL, Ph.D., *Associate, Animal Nutrition*
 WILLIAM HERSCHEL SMITH, M.S., *Associate, Animal Husbandry Extension*
 GILBERT GUSLER, B.S., *Associate, Animal Husbandry*
 ELMER ROBERTS, B.S., *Instructor, Genetics*
 WILBUR JEROME CARMICHAEL, B.S., *Instructor, Animal Husbandry*
 CHARLES IVAN NEWLIN, M.S., *Instructor, Animal Husbandry*
 JAMES BURTON ANDREWS, B.S., *Instructor, Animal Husbandry*
 ROSCOE RAYMOND SNAPP, B.S., *Instructor, Animal Husbandry*
 CLAUDE HARPER, B.S., *Assistant, Animal Husbandry*
 JAMES WILBUR WHISENAND, B.S., *Assistant, Animal Husbandry*
 EARL KIRKWOOD AUGUSTUS, B.S., *Assistant, Animal Husbandry*
 ROY HAROLD WILCOX, B.S., *Assistant, Animal Husbandry*
 MAYNARD ELMER SLATER, B.S., *Assistant, Animal Nutrition*
 JOSEPH ROSSITER ZEISENHEIM, B.S., *Assistant, Animal Nutrition*
 JOHN BENJAMIN RICE, B.S., *Assistant, Animal Husbandry*
 WILLIAM ALGERNON KINGSMILL MORKEL, B.S., *Assistant, Animal Husbandry*

Courses for Undergraduates

Beef Cattle: Animal Husbandry 11a, 11b.
 Breeding, Feeding, Management, and Marketing: Animal Husbandry 8, 21,
 28, 29, 30, 32; Farm Management 1.
 General Judging: Animal Husbandry 1a, 2a, 4a, 5, 11a, 22.
 Genetics: Animal Husbandry 30.
 Horses: Animal Husbandry 4a, 4b, 17.
 Meat: Animal Husbandry 10, 24.
 Nutrition: Animal Husbandry 7, 31.
 Poultry: Animal Husbandry 23.
 Sheep: Animal Husbandry 1a, 1b, 25, 27.
 Swine: Animal Husbandry 2a, 2b, 26.

NOTE.—Students registered in advanced courses such as 10, 22, 23, 28, 29, 32, and Farm Management 1, are required to participate in a tour of inspection of representative markets, farms, herds, flocks, and studs.

1a. Sheep: Breeds and Market Classes.—Breeds used for mutton and wool production; types, characteristics, and adaptability; market classes and grades of sheep and wool. Lectures; judging. *I*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

Animal Husbandry

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	1a	2	—	—	10,11	—	10,11	—	—	S. P.	Coffey

1b. Sheep: Breeding, Feeding, and Management.—Pure bred and grade flocks; feeding, housing, and sheperding. Lectures; reference readings. *I*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 1a and 1b simultaneously.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	1b	3	—	10	—	10	—	10	—	553 Ag.	Coffey

2a. Swine: Breeds and Market Classes.—History of the leading breeds: types, characteristics, and adaptability; market classes and grades; market reports. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	2a	2	—	—	10,11	—	10,11	—	—	S. P.	Carmichael

2b. Swine Husbandry.—Economic production of market and breeding hogs. Breeding, feeding, housing, care, sanitation, common diseases, and marketing. Lectures; assigned reading; quizzes. *II*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 2a and 2b simultaneously.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	2b	3	—	10	—	10	—	10	—	702 Ag.	Carmichael

4a. Market Classes of Horses and Mules and Breeds of Horses.—Market classes, grades, and requirements. History of the leading breeds; types, characteristics, and adaptability. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5, or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	4a	2	—	—	1,2	—	1,2	—	—	S. P.	Edmonds

4b. Breeding, Feeding, and Management of Horses.—Methods: care of stallions, mares, and foals; of work horses and drivers at labor and idle; fattening horses for market. Lectures; assigned readings. *II*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 4a and 4b simultaneously.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	4b	3	—	1	—	1	—	1	—	S. P.	Edmonds

5. Fundamentals of Live Stock Judging.—The names and location of external parts of the various kinds of live stock, the use of the score card, comparative judging, breed identification, and types of farm animals. Required in freshman year. *I or II*; (3).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	5	3	A	8,9	—	8,9	—	8,9	—	S. P.	Gusler and others
Husbandry			B	10,11	—	10,11	—	10,11	—	S. P.	

7. Principles of Animal Nutrition.—Composition and fuel value of feeding stuffs; organic and inorganic food stuffs, digestion, absorption, and metabolism; elimination of metabolic products; co-efficients of digestibility and nutritive value of feeding stuffs. *I*; (5).

Prerequisite: Animal Husbandry 8 and 21; Chemistry 13a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	7	5	Lecture	—	—	11	—	—	—	702 Ag.	Grindley
Husbandry			A, Quiz	—	11	—	11	—	—		Grindley Joseph Mitchell Slater
			B, Quiz	—	11	—	11	—	—		
			C, Quiz	11	—	—	—	11	—		
			D, Quiz	11	—	—	—	11	—		
			A, B, Lab.	10,11	—	—	—	10,11	—		
			C, D, Lab.	—	10,11	—	10,11	—	—		

8. Principles of Breeding.—Elemental facts of evolution and genetics; origin of domesticated animals and plants; history of systematic breeding; the relation to genetics of old and new theories of breeding. Required in sophomore year. *I or II*; (1).

NOTE.—See Animal Husbandry 21.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	8	1	Lecture	—	—	—	8	—	—		Detlefsen, Roberts, and Assistants
Husbandry			A, Quiz	—	—	—	—	8	—		
			B, Quiz	—	—	—	—	8	—		
			C, Quiz	—	—	—	—	9	—	702 Ag.	
			D, Quiz	—	—	—	—	9	—		
			E, Quiz	—	—	—	—	—	10		
			F, Quiz	—	—	—	—	—	10		
			G, Quiz	—	—	—	—	1	—		

9. Investigation and Thesis.—*I or II*; *(5-10).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	9	*5 to 10	—								
Husbandry											

(Arrange)

10. Meat.—Farm butchering, curing, and care of meats; yield, quality and values of meat and by-products, as related to breeding, feeding, and health of animals; classes, grades, and cuts of meat in wholesale and retail markets.

*In registering for a course with variable credit hours a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Animal Husbandry

The class will leave on its annual Chicago trip, Thursday morning, April 20, 1916. The cost will be about \$8.00. *II*; (3).

Prerequisite: Two years of university work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	10	3	—	—	9	—	9	—	—	128 Ag.	Coffey
			A, Lab.	—	—	—	—	1,2	—		
			B, Lab.	—	—	—	—	—	8,9	S. P.	Augustus

11a. Beef Cattle.—Breeds and market classes; history of the leading breeds; beef type from the standpoint of the butcher, the feeder, and the breeder; classification and value of each grade according to current market reports. Judging; lectures; quizzes; assigned readings. *I*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	11a	2	—	—	1,2	—	1,2	—	—	S. P.	Rusk Snapp

11b. Beef Production.—Breeding and management of pure bred herds; breeding for market; combined beef and milk production; economic factors in cattle feeding; influence of age, grade, breed, condition, and sex; equipment; pork and manure as by-products of beef production. Lectures; quizzes; assigned readings (text book). *I*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 11a and 11b simultaneously.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	11b	3	—	2	—	2	—	2	—	702 Ag.	Rusk Snapp

15. Dairy Cattle.—(See Dairy Husbandry 2 and 16.)

[17. Education and Driving of the Horse.—Mental qualities, peculiarities, and limitations of the horse; education and training for labor or the road; correct driving; responsibilities of the driver; courtesies of the highway. Lectures; readings; practise. *II*; (2). Not given, 1915-16.

Assistant Professor EDMONDS

Prerequisite: Animal Husbandry 4a and 4b; three semesters' work in the University or its equivalent.]

21. Principles of Feeding.—Classification, digestibility, and functions of feed nutrients; classification and values of feeding stuffs; feed requirements and calculation of balanced rations for farm animals. Required in sophomore year. *I* or *II*; (2).

Prerequisite: Chemistry 1 or 1a, Chemistry 2 and 3, Animal Husbandry 5, and registration in Animal Husbandry 8.

NOTE.—To arrange their schedule most efficiently students should register in the same section as in Animal Husbandry 8.

Animal Husbandry

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	21	2	Lecture	—	8	—	—	—	—	702 Ag.	Bull
Husbandry			A, Quiz	8	—	8	—	—	—		<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Bull Joseph Newlin Zeisenheim </div> </div>
			B, Quiz	8	—	8	—	—	—		
			C, Quiz	9	—	9	—	—	—		
			D, Quiz	9	—	9	—	—	—		
			E, Quiz	—	10	—	10	—	—		
			F, Quiz	—	10	—	10	—	—		
			G, Quiz	1	—	1	—	—	—		

22. Advanced Stock Judging.—Animal conformation, quality, and condition with reference to market and show yard requirements; selection of horses, beef cattle, sheep, and swine, for feed lot, market, and exhibition; judging at live stock shows. Dec. 21, 22, and 23, 1915, will be spent in visiting breeders in northern Illinois and southern Wisconsin, also in a visit to the University of Wisconsin. The cost of this trip will be about \$25.00. *I*; (3).

Prerequisite: Animal Husbandry 1a, 2a, 4a, 11a, or their equivalents.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	22	3	—	3	3	3	3	3	—	S. P.	Mumford
Husbandry											

23. Poultry: Types, Breeds, and Varieties.—Exhibiting and judging; principles of breeding; poultry houses and equipment; feeding, hatching, and brooding; market eggs and poultry; crate-fattening and dressing; diseases and their treatment. A limited number of short trips are taken, the total cost of which will not exceed \$10.00. *II*; (5).

Prerequisite: Animal Husbandry 5, or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	23	5	—	11	11	11	11	11	—	S. P.	Barto
Husbandry											

24. Meat.—Influence of type, condition, age, sex, and feeds upon the yield and market grade of meat products. *II*; *(2-5). *Time to be arranged.*

Professor COFFEY

Prerequisite: Animal Husbandry 10, and 1a or 2a or 11a; three years' work in the University, or its equivalent.

[25. Wool.—Factors affecting quality, quantity, strength, and condition of wool. *II*; *(2-5). Offered in alternate years, beginning second semester, 1914-15. Not given in 1915-16.

Prerequisite: Animal Husbandry 1a, 1b; three years work in the University, or its equivalent.]

26. Swine Husbandry.—Special problems. *II*; *(2-5).

Prerequisite: Animal Husbandry 2a, 2b; three years' work in the University, or its equivalent.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Animal Husbandry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	26	*2 to 5	—							(Arrange)	Carmichael

27. Sheep Husbandry.—Factors determining the importance of the industry in leading sheep growing countries, particularly different parts of the United States. *II*; *(2-5). Offered in alternate years; given second semester, 1915-16. *Time to be arranged.* Professor COFFEY

Prerequisite: Animal Husbandry 1a, 1b; three years' work in the University, or its equivalent.

28. Advanced History of Breeds of Live Stock.—Horses, beef cattle, sheep, and swine. Methods of great breeders; performances and pedigrees of famous animals; breed type as exemplified in the University and other herds. Lectures; assigned readings; problems. Dec. 21, 22, and 23, 1915, will be spent in visiting breeders in northern Illinois and southern Wisconsin, also in a visit to the University of Wisconsin. The cost of the trip will be about \$25.00. *I*; *(3-5).

Breeds offered, 1915-16

Beef cattle	Herefords, Galloways
Horses	Shires, Clydesdales, American Saddlers
Swine	Poland Chinas, Chester Whites
Sheep	Rambouillets, Oxford Downs

Breeds offered, 1916-17

Beef cattle	Shorthorns, Aberdeen Angus
Horses	Percherons, Belgians, Standard breeds
Swine	Berkshires, Duroc Jerseys
Sheep	Shropshires, Southdowns

Prerequisite: "a" and "b" courses in class of live stock elected. See note at the beginning of the description of animal husbandry courses.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	28	*3 to 5	—	9	—	9	—	9	—	128 Ag.	Mumford

29. Systems of Live Stock Farming.—Management, climate, soil, topography, location with reference to markets; the supply of land, labor, capital, and managing ability as factors in influencing the choice and adaptation of systems of production. Planning of farms for mixed and live stock systems. The class will visit some of the farms included in the Farm Management investigations being conducted by the department. This trip will cost about \$15.00. *II*; (2).

Prerequisite: Animal Husbandry 5, 8, and 21, and 6 hours' credit from 1b, 2b, 4b or 11b; Farm Management 1. See note at beginning of description of animal husbandry courses.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Animal Husbandry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	29	2	—	8	—	8	—	—	—	128 Ag.	Handschin

30. Genetics.—Heredity, variation, elements of biometry, and their practical application to breeding. Lectures; demonstrations; laboratory. *II*; (5).

Prerequisite: Two years of university work, including ten hours of botany or zoology. Before registering, students must secure the approval of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	30	5	—	11	11	11	11	11	—	702 Ag.	Detlefsen and Roberts

31. Principles of Animal Nutrition.—Carbohydrate, fat, protein, and mineral metabolism. The income and expenditure of matter and energy. Protein, mineral, and energy requirements for maintenance, growth, and production. Lecture; recitations; laboratory. *II*; (5).

Prerequisite: Animal Husbandry 7, Chemistry 5c.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	31	5	—							(Arrange)	Grindley

32. Marketing Live Stock.—Markets and methods of marketing live stock and their products. Advertising and sale of surplus pedigreed live stock. Certain inspection trips will be required of the class. The expense of these trips will be about \$15.00. *II*; (2).

Prerequisite: Two years of university work. At least 4 credits in Animal Husbandry courses 1a, 2a, 4a, and 11a. See note at beginning of description of animal husbandry courses.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	32	2	—	—	9	—	9	—	—	(Arrange)	Mumford Wilcox

33. Animal Husbandry Practicums.—Designed to give the student a working knowledge of the various operations necessary in the barn and stable management of livestock. One hour credit will be given for each two classes of livestock elected. *II*; *(1-2).

Prerequisite: Limited to senior students specializing in Animal Husbandry.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	33	*(1-2)	—	—	—	—	—	—	8-12		Heads of Divisions

(Mornings and evenings as required by instructor.)

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 1-2, but 1, or 2.

Animal Husbandry

Courses for Graduates

Students entering graduate work in animal husbandry must have had training in the fundamental principles of the subject either in connection with or in addition to an agricultural course of study equivalent to that offered in this University.

103. Live Stock Experimentation.—Objects, methods, and the sources of error in experimental work dealing with the feeding, breeding, and management of farm animals; live stock experiments at this and other experiment stations. *Once a week; I, II; ($\frac{1}{2}$ to $1\frac{1}{2}$ units). Time to be arranged.*

Professor DAVENPORT

110. Animal Nutrition.—The chemical and physiological changes and processes involved in the activities of animal life; recent publications. *Three times a week; I, II; (1 unit). Time to be arranged.*

Professor GRINDLEY, Dr. JOSEPH

111. Animal Nutrition.—Methods of examination and analysis of feeding stuffs; animal substances including flesh, fat, bone, urine, feces, and manufactured animal products. *Three to five times a week; I, II; (1 to 2 units). Time to be arranged.*

Professor GRINDLEY

112. Investigation.—Investigations along the following lines:

(a) Economic factors involved in meat production.

(b) Systems of live stock farming.

(c) The valuation of pedigrees. (a), (b) and (c), *once a week; I, II; (1 to 2 units). Time to be arranged.*

Professor MUMFORD

(d) Animal Nutrition. A research course in animal nutrition; digestion and metabolism experiments and biochemical studies connected with the nutrition of farm animals. *Five times a week; I, II; (1 to 2 units). Time to be arranged.*

Professor GRINDLEY, Dr. JOSEPH

(e) Genetics. Research problems in heredity and variation. May be taken during the summer. *Five times a week; I, II; (1 to 2 units). Time to be arranged.*

Assistant Professor DETLEFSEN

116. Seminar.—*Time to be arranged. I, II; ($\frac{1}{4}$ unit).*

Members of the Staff

117. Genetics.—Study and criticism of genetic experiments, biological and mathematical methods employed, and the validity of the conclusions. *Three to five times a week; I, II; (1 to 2 units). Time to be arranged.*

Assistant Professor DETLEFSEN

FARM MANAGEMENT

1. Elementary Farm Management.—The factors of production in the farm business; systems of farming, their distribution, and adaptation; farm organization; the distribution of capital invested; planning of the farm; farm administration or operation; planning of work; handling of labor; developing management efficiency. Lectures; quiz. The trip required in this course is the same as in Animal Husbandry 29. *II; (3).*

Prerequisite: Three semesters of required work; Economics 1 or 2 and Accountancy 11.

It is also very important that the student have credit or be registered in Agronomy 12, and have at least 6 hours credit from Animal Husbandry 1b, 2b, 4b, or 11b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Farm Management	1	3	—	2	—	2	—	2	—	702 Ag.	Handschin Wilcox

ARCHITECTURE

LORING HARVEY PROVINE, B.S., A.E., *Professor*
 NATHAN CLIFFORD RICKER, D.Arch., *Professor*
 NEWTON ALONZO WELLS, M.P., *Professor, Architectural Decoration*
 JAMES McLAREN WHITE, B.S., *Professor, Architectural Engineering, Supervising Architect*
 PERCY ASH, B.S., C.E., *Assistant Professor, Architectural Design*
 WILLIAM CALDWELL TITCOMB, A.B., B.S., *Assistant Professor*
 CHARLES RICHARD CLARK, B.S., *Assistant Professor, Architectural Construction*
 ROBERT TAYLOR JONES, B.S., *Associate*
 WILLIAM MATHEWS HEKKING, B.P., *Associate, Freehand Drawing*
 JOSEPH MITCHELL KELLOGG, M.Arch., *Instructor, Architectural Design*
 WILLIAM SIDNEY WOLFE, B.S., M.S., *Instructor, Architectural Engineering*
 RALPH STANLEY FANNING, B.S., *Instructor, Architectural Design*
 WILLIAM MACEY STANTON, B.S., M.S., *Instructor, Architectural Design*
 CARL VICTOR BURGER, B.Arch., *Instructor*
 RALPH EDWARD MUEHLMAN, *Assistant, Architectural Design*
 WINIFRED FEHRENKAMP, B.L.S., *Librarian*

13, 14, 15, 16. History of Architecture.—From the Egyptian period to modern times; effects of political, economic and local conditions; influence of materials, climate, structural systems, the various countries and periods; evolution of architectural forms. Illustrated lectures; quizzes. *I, II; (2).*

Prerequisite: Sophomore standing in architecture or architectural engineering or Architecture 31 and 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	13	2	A B	11	—	11	—	—	—	221 E. H.	Ricker
			C D	9	—	9	—	—	—	221 E. H.	Ricker

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	14	2	A B	11	—	11	—	—	—	221 E. H.	Ricker
			C D	9	—	9	—	—	—	221 E. H.	Ricker

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	15	2	A B	—	9	—	9	—	—	221 E. H.	Ricker
			C D	—	11	—	11	—	—	221 E. H.	Ricker

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	16	2	A B	—	9	—	9	—	—	221 E. H.	Ricker
			C D	—	11	—	11	—	—	221 E. H.	Ricker

23-24. Freehand Drawing.—Charcoal drawing from the cast. Water color work. *Six hours drawing per week. I, II; (2).*

Prerequisite: Architecture 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	23	2	A	1-4	—	1-4	—	—	—	405 E. H.	Wells
			B	—	1-4	—	1-4	—	—	405 E. H.	—

Architecture

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	24	2	A	1-4	—	1-4	—	—	—	405 E. H.	Wells
			B	—	1-4	—	1-4	—	—	405 E. H.	—

25. Freehand Drawing.—Principles underlying arrangement of form and color; rythm and sequence; harmony and contrast. *Six hours drawing per week. I; (2).*

Prerequisite: Architecture 23-24.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	25	2	A	8-11	—	8-11	—	—	—	406 E. H.	Wells
			B	1-4	—	1-4	—	—	—	406 E. H.	—

26. Freehand Drawing.—Charcoal, pen, pencil, and water color drawing from the cast and from still life. Out-of-door sketching. *Six hours drawing per week. II; (2).*

Prerequisite: Architecture 23-24.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	26	2	A	8-11	—	8-11	—	—	—	406 E. H.	Wells
			B	1-4	—	1-4	—	—	—	406 E. H.	—

27. Freehand Drawing.—Sketching from still life; study of proportions. *Six hours drawing per week. I; (2).*

Prerequisite: Architecture 25-26.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	27	2	A	—	1-4	—	1-4	—	—	406 E. H.	Wells

28. Freehand Drawing.—Water color; original decorative composition; out-of-door sketching. *Six hours drawing per week. II; (2).*

Prerequisite: Architecture 25-26.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	28	2	A	—	1-4	—	1-4	—	—	406 E. H.	Wells

31. Architectural and Freehand Drawing.—Instruments, pen, pencil, and brush; lettering; shades and shadows; perspective. Charcoal drawing from the cast. *One lecture and ten hours drawing per week. I; (4).*

Prerequisite: Registration in G. E. D. 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	31	4	A	—	—	—	—	3	—	221 E. H.	Muehlman Stanton
			A	—	—	—	—	1-3	10-12	405 E. H.	
			A	1-4	—	1-4	—	—	—	421 E. H.	
			B	—	—	—	—	3	—	221 E. H.	
			B	10-12	—	—	—	10-12	—	405 E. H.	
			B	—	1-4	—	1-4	—	—	421 E. H.	
			C	—	—	—	—	3	—	221 E. H.	
			C	—	—	8-10	—	—	8-10	405 E. H.	
			C	8-11	—	—	—	8-11	—	421 E. H.	
			D	—	—	—	—	3	—	221 E. H.	
For students taking Landscape Gardening			D	8-10	—	—	—	8-10	—	405 E. H.	
			D	—	8-11	—	8-11	—	—	421 E. H.	

32. Architectural and Freehand Drawing.—Elements of architecture; walls, moldings, doors, windows, the Orders, vaults, roofs, stairs. Wash rendering, stereotomy, charcoal drawing from the cast. Lectures and sketching. *One lecture and ten hours of drawing per week. II; (4).*

Prerequisite: Architecture 31.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	32	4	A	—	—	—	—	3	—	221 E. H.	Muehlman Stanton
			A	—	—	—	—	1-3	10-12	405 E. H.	
			A	1-4	—	1-4	—	—	—	421 E. H.	
			B	—	—	—	—	3	—	221 E. H.	
			B	10-12	—	—	—	10-12	—	405 E. H.	
			B	—	1-4	—	1-4	—	—	421 E. H.	
			C	—	—	—	—	3	—	221 E. H.	
			C	—	—	8-10	—	—	8-10	405 E. H.	
			C	8-11	—	—	—	8-11	—	421 E. H.	
			C	—	—	—	—	3	—	221 E. H.	
For students taking Landscape Gardening		{	D	8-10	—	—	—	8-10	—	405 E. H.	
			D	—	8-11	—	8-11	—	—	421 E. H.	

33-34. Design.—(Elementary.) Rendered order and sketch problems involving simple composition; library research in elements of composition. *One lecture and nine hours drafting room per week. I, II; (3).*

Prerequisite: Architecture 31, 32.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	33	3	A	—	—	—	—	8	—	400 E. H.	Titcomb Kellogg
			A	—	1-4	—	1-4	—	8-11	319 E. H.	
			B	—	—	—	—	8	—	400 E. H.	
			B	1-4	—	1-4	—	1-4	—	319 E. H.	

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	34	3	A	—	—	—	—	8	—	400 E. H.	Titcomb Kellogg
			A	—	1-4	—	1-4	—	8-11	319 E. H.	
			B	—	—	—	—	8	—	400 E. H.	
			B	1-4	—	1-4	—	1-4	—	319 E. H.	

35-36. Design.—(Intermediate.) Rendered plan and sketch problems; library research in plan and interior elements. *Fifteen hours drafting room per week. I, II; (5).*

Prerequisite: Architecture 33-34.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	35	5	A	—	—	—	—	8-11	8-11	319 E. H.	Titcomb Kellogg
			A	1-4	—	1-4	—	1-4	—	319 E. H.	
			B	8-11	—	8-11	—	8-11	8-11	319 E. H.	
			B	—	—	—	—	1-4	—	319 E. H.	

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	36	5	A	—	—	—	—	8-11	8-11	319 E. H.	Titcomb Kellogg
			A	1-4	—	1-4	—	1-4	—	319 E. H.	
			B	8-11	—	8-11	—	8-11	8-11	319 E. H.	
			B	—	—	—	—	1-4	—	319 E. H.	

37. Design.—(Advanced.) Original design. *Twenty-one hours drafting room per week. I; (7).*

Prerequisite: Architecture 35-36.

Architecture

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	37	7	A	—	9-12	—	9-12	8-11	8-11	408 E. H.	Ash
			A	1-4	—	1-4	—	1-4	—	408 E. H.	

38. Advanced Design or Thesis.—An extended original problem in design or construction. *Twenty-one hours drafting room per week. II; (7).*

Prerequisite: Architecture 37.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	38	7	A	—	9-12	—	9-12	8-11	8-11	408 E. H.	Ash
			A	1-4	—	1-4	—	—	—	408 E. H.	

43. Working Drawings.—The growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; detailing various parts on a large scale; floors, walls, roofs, doors, windows, cornices, stairs, wainscoting, cabinet-work, interior finish; preparation of working drawings. Kidder's *Building Construction, Part II*. *Two lectures and four hours drawing per week. I; (3).*

Prerequisite: General Engineering Drawing 2; Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	43	3	A	—	8	—	8	—	—	422 E. H.	Jones Fanning
			A	—	9-11	—	9-11	—	—	319 E. H.	
			B	8	—	8	—	—	—	422 E. H.	
			B	9-11	—	9-11	—	—	—	319 E. H.	

44. Working Drawings.—Materials for stone masonry; their uses, defects, qualities, and preparation; kinds of masonry and external finish; tools for stone cutting; brick masonry, its materials and bonds; terra cotta design, manufacture, and use; columns, beams, girders, and footings; joints and connections. Working drawings. Kidder's *Building Construction and Superintendence, Part I*. *Two lectures and four hours drawing per week. II; (3).*

Prerequisite: General Engineering Drawing 2; Architecture 31, 32, 43.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	44	3	A	—	8	—	8	—	—	422 E. H.	Jones Fanning
			A	—	9-11	—	9-11	—	—	319 E. H.	
			B	8	—	8	—	—	—	422 E. H.	
			B	9-11	—	9-11	—	—	—	319 E. H.	

45. Graphic Statics.—Elementary Graphic Statics; its application to trussed roofs, steel and masonry arches, domes. The graphical representation of reactions, bending moments, shear and deflection in beams. (For architects.) Ricker's *Notes on Graphic Statics*. *One lecture and six hours drawing per week. I; (3).*

Prerequisite: Theoretical and Applied Mechanics 14, 15, 16.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	45	3	A B	11	—	—	—	—	—	400 E. H.	Wolfe
			A B	—	1-4	—	1-4	—	—	—	

46. Structures.—Wooden and steel roofs; determination of section of members; design of joints; mill and steel skeleton construction. *One lecture and six hours drawing per week. II; (3).*

Prerequisite: Architecture 45.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	46	3	A B	11	—	—	—	—	—	}	Wolfe
			A B	—	1-4	—	1-4	—	—		

55. Building Sanitation.—Plumbing, trap ventilation, removal of wastes; water closets; drains and systems of water supply; sewage disposal; water supply and fixtures in dwellings. (For architects.) Cosgrove's *Principles and Practise of Plumbing*. Recitations; lectures; designs for special problems. *I*; (1).

Prerequisite: Physics 9a-9b, 10a-10b; Architecture 43, 44.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	55	1	A B	—	10	—	—	—	—	400 E.H.	Clark

59. Domestic Architecture.—(Given in connection with Household Science 2.) Lectures; criticism. *Arrange hours; I.*

Assistant Professor ASH, Mr. CLARK, Mr. KELLOGG

60. Special Lectures.—Special Lectures on Architectural Subjects. (For architects.) *II*; (1).

Prerequisite: Senior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	60	1	A	—	8	—	8	—	—	400 E. H.	—

65-66. Theory of Architecture.—Influence of function on architectural form; plan and elevation; problem analysis. Lectures; research; exercises. *I, II*; (1).

Prerequisite: Architecture 33, 34.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	65	1	A B	—	—	—	10	—	—	400 E.H.	Wells

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	66	1	A B	—	—	—	10	—	—	400 E.H.	Wells

67. Theory of form.—Principles underlying arrangement of form; architectural ornament and composition, proportion and balance. *Six hours drawing per week. I*; (2).

Prerequisite: Senior standing in Architecture.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	67	2	A	—	8-11	—	8-11	—	—	406 E. H.	—

68. Specifications.—General and special clauses and their arrangement; classifying material to facilitate writing specifications; practise in writing several sets; relations of the architect, owner, and builder; office organization; building ordinances; professional ethics. (For Architects.) *II*; (3).

Prerequisite: First three years of the courses in Architecture.

Architectural Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	68	3	A	11	—	11	—	11	—	422 E. H.	Clark

Courses for Graduates

Entrance upon graduate work in architecture presupposes the full undergraduate course in that subject. Semi-weekly conferences are held and additional instruction given in all courses as may be required.

101. Architectural Construction.—Design of special structures. *Arrange hours; I, II.* Professor RICKER, Professor PROVINÉ

102. Sanitation of Buildings.—The planning of sanitation, warming, and ventilation. *Arrange hours; I, II.* Professor RICKER, Mr. CLARK

103. Advanced Architectural Graphics.—Graphic statics. Unusual types of footings, columns, trusses, etc. *Arrange hours; I or II.*

Professor RICKER, Professor PROVINÉ

104. Architectural Design.—Advanced course. *Arrange hours; I or II.*

Assistant Professor ASH

105. Architectural Practise.—Contracts, specifications, and office methods; architectural jurisprudence. *Arrange hours; I or II.*

Professor RICKER, Professor PROVINÉ

106. Advanced Architectural History.—Special research. *Arrange hours; I or II.* Professor RICKER

ARCHITECTURAL ENGINEERING

33. Architectural Drawing.—Lettering; elements of architecture; walls, mouldings, doors, windows, shades and shadows, perspective, the Orders, vaults, roofs, stairs; wash rendering, stereotomy, charcoal, drawing from the cast. Lectures and sketching. *Nine hours drawing per week. I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	33	3	C	—	—	—	—	1	—	400 E.H.	Kellogg
			C	1-4	1-4	—	—	2-4	—	319 E.H.	
			D	—	—	—	—	1	—	400 E.H.	
			D	—	—	1-4	1-4	—	8-10	319 E.H.	

34. Design.—(Elementary.) Rendered order problems and sketch problems; library research. *Nine hours drawing per week. II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	34	3	C	—	—	—	—	1	—	400 E.H.	Kellogg
			C	1-4	1-4	—	—	2-4	—	319 E.H.	
			D	—	—	—	—	1	—	400 E.H.	
			D	—	—	1-4	1-4	—	8-10	319 E.H.	

43. Working Drawings.—The growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; floors, walls, roofs, doors, windows, cornices, stairs, wainscoting, cabinet-work, interior finish; preparation of working drawings. (For architectural engineers.) *One recitation and three hours drawing per week. I; (2).*

Prerequisite: Architectural Engineering 31; General Engineering Drawing 2.

Architectural Engineering

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	43	2	C	—	—	1	—	—	—	422 E.H.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Jones Fanning </div> </div>
			C	—	—	—	1-4	—	—	319 E.H.	
			D	1	—	—	—	—	—	422 E.H.	
			D	—	1-4	—	—	—	—	319 E.H.	

44. Working Drawings.—Materials for stone masonry; their uses, defects, qualities, and preparation; kinds of masonry and external finish; tools for stone cutting; brick masonry; bonds; terra cotta design, manufacture, and use; columns, beams, girders; joints and connections; preparation of working drawings. *One recitation and three hours drawing per week. II; (2).*

Prerequisite: Architectural Engineering 31, 43; General Engineering Drawing 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	44	2	C	—	—	1	—	—	—	422 E.H.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Jones Fanning </div> </div>
			C	—	—	—	1-4	—	—	319 E.H.	
			D	1	—	—	—	—	—	422 E.H.	
			D	—	1-4	—	—	—	—	319 E.H.	

45. Graphic Statics.—Elements, and applications to forces; beams under fixed and moving loads. *One lecture and six hours drawing per week. I; (3).*

Prerequisite: Theoretical and Applied Mechanics 20; registration in Theoretical and Applied Mechanics 25.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	45	3	C	—	—	—	—	11	—	400 E.H.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div>Wolfe</div> </div>
			C	8-11	—	8-11	—	—	—	319 E.H.	
			D	—	—	—	—	11	—	400 E.H.	
			D	—	8-11	—	8-11	—	—	319 E.H.	

46. Advanced Graphic Statics.—The analysis of masonry arches, domes, and vaults; large and unusual forms of roof trusses. *One lecture and six hours drawing per week. II; (3).*

Prerequisite: Architectural Engineering 45.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	46	3	C	—	—	—	—	11	—	—	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div>Wolfe</div> </div>
			C	8-11	—	8-11	—	—	—	319 E.H.	
			D	—	—	—	—	11	—	—	
			D	—	8-11	—	8-11	—	—	319 E.H.	

47. Architectural Engineering.—Design and working drawings of trusses, members and joints, plate girders, chimneys; investigations of wind bracing. *Fifteen hours drawing per week or the equivalent. I; (5).*

Prerequisite: Theoretical and Applied Mechanics 26, Architectural Engineering 44, 46.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	47	5	C D	8-11	1-4	8-11	1-4	8-11	—	407 E.H.	Clark

Art and Design

48. **Architectural Engineering.**—Design and detail of footings; investigation of framed structures; working drawings. *Fifteen hours drawing per week or the equivalent. II; (5).*

Prerequisite: Architectural Engineering 47.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	48	5	C D	8-11	1-4	8-11	1-4	8-11	—	407 E.H.	Clark

57. **Fireproof Construction.**—Principles and design of fireproof construction; the advantages of each type. *Two lectures or recitations per week. I; (2).*

Prerequisite: Theoretical and Applied Mechanics 26, Architectural Engineering 44, 46, and registration in Architectural Engineering 47.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	57	2	C D	—	11	—	11	—	—	400 E.H.	Provine

58. **Fireproof Construction.**—(Continuation of first semester's work.) Details and working drawings. *Six hours drawing per week. II; (2).*

Prerequisite: Architectural Engineering 47, 57, and registration in Architectural Engineering 46.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	58	2	C D	—	9-11	—	9-12	—	—	407 E.H.	Provine

68. **Estimates and Specifications.**—Methods of estimating, illustrated by problems; a study of specifications, their general and special clauses, and arrangement; relations of architect, owner, and builder. (For Architectural Engineers.) *Four recitations per week. II; (4).*

Prerequisite: Senior standing in Architectural Engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	68	4	C D	11	11	11	—	11	—	400 E.H.	Provine

ART AND DESIGN

EDWARD JOHN LAKE, B.S., *Assistant Professor*

MARY MINERVA WETMORE, *Instructor*

CHARLES EARL BRADBURY, B.P., *Instructor*

GIDEON ROBERT FORBES, M.L.A., *Instructor*

1. **Freehand Drawing.**—Practise drawing in charcoal and pencil; perspective principles with application; light, shadows, shade, and reflections in monochrome; lectures and reference reading on graphical representation and the reproductive processes in printing. *I or II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	1	3	A	8,9	—	8,9	—	8,9	—	406 U. H.	Bradbury
			B	10,11	—	10,11	—	10,11	—	406 U. H.	Lake
			C	1,2	—	1,2	—	1,2	—	406 U. H.	Bradbury
			D	—	10,11	—	10,11	—	10,11	406 U. H.	Forbes

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 1	3		A	8,9	—	8,9	—	8,9	—	406 U. H.	Lake
			B	1,2	—	1,2	—	1,2	—	406 U. H.	Forbes

2. Light and Shade.—Shaded drawing in monochrome in preparation for painting in oils and water-colors, with emphasis on values and composition. *II; (2).*

Prerequisite: Art and Design 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 2	2	2	—	1,2	—	1,2	—	1,2	—	406 U. H.	Bradbury

3a-3b. Drawing from the Antique.—Practise drawing from plaster models and from life of anatomical forms in monochrome in preparation for painting the human figure; anatomical proportion and construction, with lectures on proportion, construction, composition, and action in the representation of the human figure. Either semester may be taken separately. *I, II; (3).*

Prerequisite: Art and Design 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 3a	3	—	—	10,11	—	10,11	—	10,11	—	403 U. H.	Bradbury

SECOND SEMESTER

Art and Design 3b 3 Schedule the same as for 3a (first semester).

4a-4b. Water Color Painting.—Practise painting of still-life; flowers, and sketching out-doors, with application to pictorial and decorative art. *I, II; (3).*

Prerequisite: Art and Design 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 4a	3	—	—	1,2,3	—	1,2,3	—	1,2,3	—	407 U. H.	Wetmore

SECOND SEMESTER

Art and Design 4b 3 Schedule the same as for 4a (first semester).

5a-5b. Drawing from Life.—Drawing in monochrome from life, with application to pictorial and decorative purposes. *I, II; (3).*

Prerequisite: Art and Design 1, 3a or 3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 5a	3	—	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

SECOND SEMESTER

Art and Design 5b 3 Schedule the same as for 5a (first semester).

6a-6b. Portrait in Oil Colors.—Painting in oil colors from costumed model, with especial attention to portrait and character study. *I, II; (3).*

Prerequisite: Art and Design 1, 3a or 3b, 5a-5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 6a	3	—	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

Art and Design

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	6b	3		Schedule the same as for 6a (first semester).							

6c. Portrait in Oil Colors.—(Advanced course). A continuation of 6a-6b. *II*; (3).

Prerequisite: Art and Design 1, 3a or 3b, 5a-5b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	6c	3	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

7a-7b. Still-Life in Oil Colors.—Practise painting of still-life; flowers and sketching out-doors in oil colors, with application to pictorial and decorative art. *I, II*; (3).

Prerequisite: Art and Design 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	7a	3	—	1,2,3	—	1,2,3	—	1,2,3	—	408 U. H.	Wetmore

SECOND SEMESTER

Art and Design	7b	3		Schedule the same as for 7a (first semester).							
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7c. Still-life in Oil Colors.—(Advanced course). A continuation of 7a-7b. *II*; (3).

Prerequisite: Art and Design 1, 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	7c	3	—	1,2,3	—	1,2,3	—	1,2,3	—	408 U. H.	Wetmore

8a-8b. Modeling.—Clay modeling of anatomical and decorative forms; the making of plaster molds and models; relative study of sculptural art. *I, II*; (3).

Prerequisite: Art and Design 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	8a	3	—	—	1,2,3	—	1,2,3	—	—	Basement Law Building	Lake

SECOND SEMESTER

Art and Design	8b	3		Schedule the same as for 8a (first semester).							
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10. Sketching.—Practise in pen, pencil; monochrome wash or charcoal rendering from landscape, still-life, and figure, with especial attention to the requirements for reproduction. *I* or *II*; (1).

Prerequisite: Art and Design 1.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	10	1	—	—	—	—	—	—	10,11	403 U. H.	Bradbury

11. Pictorial Design.—A study of the composition and appreciation of pictures. Lectures with occasional reports. *I* or *II*; (1).

Art and Design

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	11	1	—	—	—	—	—	—	10,11	402 U. H.	Lake

12. Design.—The theory and practise of design; lectures on the theory of pure design and the effect of material upon execution; the fitness of various forms of media for different sorts of design; space division and space relations; the theory of color; color schemes and exercises; conventionalization of natural forms for various functions; practise in execution. *I* or *II*; (2).

Prerequisite: Art and Design 1.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	12	2	Lecture	10	—	—	—	—	—	410 U. H.	Forbes
			A,Conference	—	—	10	—	—	—	402 U. H.	Forbes
			B,Conference	—	—	—	—	10	—	402 U. H.	Forbes

13. Design.—(Advanced course). The design of objects in the styles of different periods; theory of pure design with practical problems; lectures and reading on the development of historic ornament. This course is directed toward giving the student a larger vocabulary for expressing himself through design. *II*; (3).

Prerequisite: Art and Design 1, 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	13	3	—	—	10,11	—	10,11	—	—	402 U. H.	Forbes

14. Design.—(Advanced Practise). Designs are executed upon a special field and in a medium selected by the student. An extended study is made of the chosen field of design. *I* or *II*; (3).

Prerequisite: Art and Design 1, 12, 13.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	14	3	—					(Arrange)		402 U. H.	Forbes

19. History of the Fine Arts.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting previous to the Italian Renaissance. *I*; (2).

Prerequisite: One year of college work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	19	2	—	3	—	3	—	—	—	410 U. H.	Lake

20. History of the Fine Arts.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting of the Italian Renaissance and to the present time. *II*; (2).

Prerequisite: One year of college work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	20	2	—	3	—	3	—	—	—	410 U. H.	Lake

ASTRONOMY

JOEL STEBBINS, Ph.D., *Professor*FRANK WALKER REED, Ph.D., *Instructor*LARS ALVIN WELO, A.M., *Research Assistant*

No major is offered in astronomy. Students may well make mathematics or physics their major, and take astronomy 7, 8, 14, and 15 as a minor.

Upper classmen without mathematical training may elect astronomy 1. Astronomy 4 is for beginners but requires trigonometry. Other courses should be taken in the order: 3, 15, 14, 7, 8.

Courses for Undergraduates

1. Elementary Astronomy.—Lectures; recitations; one evening a week at the observatory. (Mathematics not required.) *I*; (3).

Prerequisite: Sophomore standing.

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Astronomy	1	3	—	11	—	11	—	11	—	228 N. H.
										Stebbins

3. Astronomy for Engineers.—Rough and accurate determinations of latitude, azimuth, and time, especially with the ordinary surveyor's transit; the art of computing. *II*; (2).

Prerequisite: Mathematics 7.

SECOND SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Astronomy	3	3	—	10,11	—	10,11	—	10,11	—	Obs.
										Stebbins

4. General Astronomy.—Lectures; recitations; two evenings a week at the observatory. *II*; (5).

Prerequisite: Mathematics 4.

SECOND SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Astronomy	4	5	—	9	9	9	9	9	—	425 N. H.
										Reed

For Advanced Undergraduates and Graduates

7-8. Theoretical Astronomy.—Celestial mechanics; theory of orbits; perturbations; canonical transformations. *I, II*; (3). *Time to be arranged.*

Dr. REED

Prerequisite: Mathematics 9.

9-10. Celestial Mechanics.—Properties of canonical systems of differential equations; integration by series; periodic and asymptotic solutions; integral invariants. *I, II*; (3). *Time to be arranged.*

Dr. REED

Prerequisite: Mathematics 16; Astronomy 7-8.

14. Observational Astronomy.—The working methods of an astronomical observatory; individual problems. *II*; (3). *Time to be arranged.*

Prerequisite: Astronomy 15.

Professor STEBBINS

15. Geodetic Astronomy.—The sextant, transit, and zenith telescope; methods similar to those of the United States Coast Survey. *I*; (3).

Prerequisite: Mathematics 7.

Bacteriology

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	15	3	—	1,2	—	—	10,11	—	—	Obs.	Stebbins

Courses for Graduates

101. Seminar and Thesis.—Three times a week; I, II; (1 unit). Time to be arranged. Professor STEBBINS

102. Stellar Astronomy.—Orbits of binary stars; variable stars; theoretical photometry. Three times a week; I, II; (1 unit). Time to be arranged. Professor STEBBINS

BACTERIOLOGY

(See also BOTANY.)

JOEL ANDREW SPERRY, 2d., Ph.D., *Instructor*

FRED WILBUR TANNER, M.S., *Assistant*

CECIL ROBERT GROSS, B.S., *Graduate Assistant*

No major is offered for the present in Bacteriology.

Courses for Undergraduates

5. Introductory Bacteriology.—Morphology and physiology of bacteria and related microorganisms; technique of cultivation and observation. I or II; (5).

Prerequisite: Chemistry 3; junior standing.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	5	5	Lecture	10	—	10	—	—	—	228 N. H.	Sperry
			A Quiz	11	—	11	—	—	—	303 Ag.	Tanner
			*B Quiz	—	10	—	10	—	—	303 Ag.	Tanner
			C Quiz	1	—	1	—	—	—	303 Ag.	—
			A Laboratory	8,9	—	8,9	—	8,9	—	321 Ag.	—
			B Laboratory	—	8,9	—	8,9	—	8,9	321 Ag.	Tanner
			*C Laboratory	—	1,2	—	1,2	1,2	—	321 Ag.	Sperry

*First semester only.

6. Bacteriology for Sanitary Engineers.—Bacteriological and microscopical methods applied to examination of water and sewage. Theories of filtration, sterilization, and filter control. Begins Dec. 3. I; (2).

FIRST SEMESTER

(Beginning December 3)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	6	2	Lecture	—	—	—	—	9	—	303 Ag.	Sperry
			Laboratory	1,2,3	—	1,2,3	—	—	10,11	321 Ag.	Tanner

For Advanced Undergraduates and Graduates

8. Applied Bacteriology.—Applications of bacteriology; decay of organic matter in nature; soil and sewage bacteria; food bacteria; water bacteria; pathogenic bacteria. II; (5).

Prerequisite: Bacteriology 5; Chemistry 9, or the equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	8	5	Lecture	—	—	8	—	8	—	306 Ag.	Tanner
			Laboratory	—	10,12	—	10,12	—	10,12	321 Ag.	Tanner

Bacteriology

18a-18b. Journal Meeting in Bacteriology.—Required of all students specializing in bacteriology. *I, II; (1).*

Prerequisite: Bacteriology 5.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	18a	1	—	—	—	—	—	11	—	303 Ag.	Sperry

SECOND SEMESTER				
Bacteriology	18b	1	Schedule the same as for 18a (first semester).	

19. General Bacteriology.—For graduate students in science. *I or II; (1 unit).*

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	19	1 unit	Lecture	10	—	10	—	—	—	321 Ag.	Sperry
			A, Quiz	11	—	11	—	—	—	303 Ag.	Tanner
			C, Quiz	1	—	1	—	—	—	303 Ag.	Tanner
			Laboratory				(Arrange)			321 Ag.	—

26. Pathological Bacteriology.—The disease-producing organisms; their effects upon the animal, and the reaction of the host. Lectures and laboratory. *II; (3).*

Prerequisite: Bacteriology 5; Physiology 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	26	3	—	1,2	—	1,2	—	1,2	—	323 Ag.	Sperry

27. Epidemiology.—The ways in which contagious diseases are spread. Lectures. *I; (2).*

Prerequisite: Bacteriology 5.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	27	2	—	—	11	—	11	—	—	303 Ag.	Sperry

Courses for Graduates

The work outlined below is open only to graduate students who have had at least one year's work in bacteriology, and satisfactory training in chemistry.

103. Physiology of Bacteria.—The facts and theories of fermentation and growth and death of bacteria. *I; (1 unit).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	103	1 unit	Lectures	—	8	—	8	—	—	303 Ag.	Sperry
			Laboratory				(Arrange)			312 Ag.	Sperry

105. Classification of Bacteria.—Variability of species; characters; mutations; standard and biometrical classifications. *II; (1 unit).*

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	105	1	Lectures	—	8	—	8	—	—	303 Ag.	Sperry
			Laboratory				(Arrange)			312 Ag.	Sperry

107. Research in Bacteriology.—The physiology of bacteria; food bacteriology. *I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	107	1 or 2 Laboratory units							312 Ag.	Sperry

BANKING

(See ECONOMICS.)

BIOLOGY

(See BOTANY, ENTOMOLOGY, PHYSIOLOGY, and ZOOLOGY.)

BOTANY

WILLIAM TRELEASE, D.Sc., LL.D., *Professor*
 THOMAS JONATHAN BURRILL, Ph.D., LL. D., *Professor, Emeritus*
 CHARLES FREDERICK HOTTES, Ph.D., *Professor*
 FRANK LINCOLN STEVENS, Ph.D., *Professor*
 STELLA MARY HAGUE, Ph.D., *Instructor*
 WALTER BYRON McDUGALL, Ph.D., *Instructor*
 ROSALIE MARY PARR, A.M., *Assistant*
 HARRY DWIGHT WAGGONER, A.B., *Assistant*
 NORA ELIZABETH DALBEY, A.M., *Assistant*
 FORREST ELLWOOD KEMPTON, M.S., *Assistant*
 BERT EDWIN QUICK, A.B., *Assistant*
 WILLIAM EUGENE PICKLER, A.B., *Assistant*
 ROBERT LESLEY DAVIS, B.S., *Assistant*
 FRED WILBUR TANNER, M.S., *Assistant (Bacteriology)*
 HAROLD DUDLEY CLAYBERG, M.S., *Assistant*
 LEE ELLIS MILES, A.B., *Assistant*
 WALTER SPURGEON BEACH, M.S., *Assistant*
 ESTHER YOUNG, A.M., *Assistant*
 CECIL ROBERT GROSS, B.S., *Graduate Assistant (Bacteriology)*

Major: 20 hours exclusive of Botany 1, 4, and 4d, made up of courses grouped along one of five lines, according to the suggestions given below.

Minor: 20 hours chosen from chemistry, entomology (exclusive of 1a and 1b), geology, physics, physiology, and zoology. At least eight hours must be offered in one subject.

Courses offered are of four types; the first intended to meet the needs of beginners; the second laying a foundation for methods of accuracy in observation, manipulation, and experimentation through the study of some fundamentally important subdivision of the science; the third giving practise in methods of investigation by the study of advanced problems varied to suit the needs and interests of the student; and the fourth teaching independent research by means of thesis subjects leading to the discovery of new facts or laws.

The work of any semester may be credited separately except when a problem is left incomplete in one of the courses open to graduates.

For the convenience of undergraduates in the College of Liberal Arts and Sciences who elect major work in botany the following combinations of courses are suggested:—(a) General; 2a, 3b, 4a, 14a-14b, 23; (b) Specializing in morphology; 2a, 2b, 3a, 4a, 4b, or 4c; (c) Specializing in pathology; 2a or 3a, 7a, 7b, 16a-16b, 4a, or 17a-17b, or 21; (d) Specializing in physiology; 2b, 3a, 3b, 9a, or 9b; (e) Specializing in taxonomy; 2a, 4a or 4b or 4c, 14a-14b, 16a-16b, or 17a-17b.

Botany

Students taking botany as a foundation for agronomy are advised to select courses 1, 3a, 3b, 4a, 7a-7b, and advanced work on some special topic or topics under courses 9, 15, or 17a-17b. Students who expect to teach botany are advised to elect 2a, 3b, 4a, 14a-14b, 23, and advanced work in one or more of the special courses 9a-9b, 16a-16b, or 17a-17b.

A. COURSES IN BOTANY

Courses for Undergraduates

1. General Botany.—The structure, physiology, natural history, and uses of plants. Lectures, quiz, laboratory. *Students are advised to complete elementary chemistry, before taking this course. I or II; (5).*

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	1	5	Lecture	—	9	—	9	—	—	228 N. H.	Trelease
			E, Quiz	—	8	—	8	—	—		
			F, Quiz	—	—	10	—	10	—		
			G, Quiz	—	10	—	10	—	—		
			H, Quiz	—	1	—	1	—	—		
			I, Quiz	—	—	11	—	11	—		
			J, Quiz	—	11	—	11	—	—		
			(Primarily for Students in Agriculture)								McDougall and Assistants
			A, Laboratory	10,11	—	10,11	—	10,11	—	216 N. H.	
			B, Laboratory	1,2	—	1,2	—	1,2	—	216 N. H.	
			(Primarily for Students in Liberal Arts and Sciences)								
			C, Laboratory	8,9	—	8,9	—	8,9	—	216 N. H.	
			D, Laboratory	—	10,11	—	10,11	—	10,11	216 N. H.	

2a. Morphology of Thallophytes.—Comparative laboratory study of types of the lower plants.

This and the following course are intended to give personal acquaintance with the vegetable kingdom through the study of living types selected so as to present in natural sequence the increasing complexity of structure and function which marks evolutionary development. *I; (5).*

Prerequisite: Botany 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	2a	5	Lecture	—	2	—	2	—	—	229 N. H.	Hague
			Laboratory	1,2	1	1,2	1	1,2	—	306 N. H.	Hague

2b. Morphology of Cormophytes.—Comparative laboratory study of selected types of the higher plants. *II; (5).*

Prerequisite: Botany 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	2b	5	Lecture	—	2	—	2	—	—	229 N. H.	Hague
			Laboratory	1,2	1	1,2	1	1,2	—	306 N. H.	Hague

3a. Plant Anatomy, Histology and Technique.—The foundation of an exact knowledge of plant structure, especially of protoplasts and their parts and of the behavior and relations of the nucleus; the best methods of fixing, sectioning, staining and examining tissues, modeling from serial sections, and photomicrography. *I; (5).*

Prerequisite: Botany 1.

Botany

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	3a	5	Lecture	—	11	—	11	—	—	229 N. H.	Hottes
			Laboratory	10,11	10	10,11	10	10,11	—	204 N. H.	Hottes

3b. Plant Physiology.—A foundation course preparatory to advanced work in the science and in its applications to forestry and horticulture, and to crop judging and other phases of agronomy. *II*; (5).

Prerequisite: Botany 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	3b	5	Lecture	—	11	—	11	—	—	229 N. H.	Hottes
			Laboratory	10,11	10	10,11	10	10,11	—	204 N. H.	Hottes

4. The Local Flora.—Morphology, identification, and classification of wild plants. A laboratory and field course for students desiring personal acquaintance with the plants of Illinois, and especially for those qualifying as teachers in the public schools. *II*; (3).

Prerequisite: Entrance botany or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4	3	—	8,9	—	8,9	—	8,9	—	306 N. H.	Hague

4a. Taxonomy of Cormophytes.—Structure, identification and classification of higher plants. Laboratory; field work on flowering plants, and weeds. *II*; (5).

Prerequisite: Botany 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4a	5	—	10,11	10,11	10,11	10,11	10,11	—	305 N. H.	Trelease

4b. Taxonomy of Algae and Bryophytes.—Structure, identification, and classification. *I*; (5).

Prerequisite: Botany 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4b	5	—	8,9	8,9	8,9	8,9	8,9	—	306 N. H.	Hague

4c. Taxonomy of Fungi.—Structure, identification, and classification. *II*; (5).

Prerequisite: Botany 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4c	5	—	10,11	10,11	10,11	10,11	10,11	—	Botany Annex	Stevens

4d. Trees and Shrubs of the Campus.—A systematic study of the woody plants most used for decorative purposes. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	4d	3	—	8,9	—	8,9	—	8,9	—	304 Ag.	Trelease

Botany

7a. Plant Pathology.—Causal agents, symptoms, diagnosis, and treatment. *I*; (5).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Botany	7a	5	—	8,9	8,9	8,9	8,9	8,9	—	Botany Annex	Stevens	

7b. Methods in the Study of Fungi.—Methods of isolation, cultivation, and inoculation of fungi and bacteria. *II*; (5).

Prerequisite: Botany 1.

				SECOND SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Botany	7b	5	—	8,9	8,9	8,9	8,9	8,9	—	Botany Annex	Stevens	

20. Plant Diseases.—An information course, for credit in the College of Agriculture only. More important diseases of commonly cultivated plants, diagnosis, and treatment. Lectures and laboratory. *I*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Botany	20	3	Lecture	9	—	—	—	—	—	—	N.H.	Stevens
			A.Laboratory	—	10,11	—	10,11	—	—	—	403 N.H.	} Stevens
			B.Laboratory	—	—	10,11	—	10,11	—	—		

21. Crop Diseases.—Structure, identification, and treatment. *II*; (3).

Prerequisite: Botany 20 or 7a.

Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Botany	21	3	Lecture	9	—	—	—	—	—	—	N.H.	Stevens
			Laboratory	—	10,11	—	10,11	—	—	—	—	—

23. Plant Ecology.—The life of plants in their natural habitats, and in relation to environment, to animals, and to each other. Lectures, laboratory, and field work. *I*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Botany	23	3	Lecture	—	8	—	8	—	—	229 N. H.	McDougall	
			Laboratory	—	—	—	—	—	8-12	304 N. H.	McDougall	
			or Field									

For Advanced Undergraduates and Graduates

Students who take courses open for credit to graduates are advised to register also for course 10a-10b, the weekly meeting devoted to current literature in botany, which is obligatory for candidates for an advanced degree with botany as a major subject.

Candidates for advanced degrees in botany must offer for admission to the graduate courses at least 20 hours in University botany, exclusive of Botany 1, and inclusive of courses 2a, 3b, 4a, and either 7a, 9b, 17a, or 17b, or its equivalent.

Graduate students who elect botany for minor credit must offer the equivalent of 10 hours in University botany, exclusive of Botany 1, as a prerequisite to the courses listed for graduates and advanced undergraduates.

9a-9b. Plant Anatomy or Physiology.—Problems for those specializing either in anatomy with technique, or in physiology, or in the application of these to plant breeding, crop production; and forestry. *I, II; *(3 or 5).*

Prerequisite: 10 hours of botany, including course 3a or 3b, and junior standing.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	9a *3 or 5	Laboratory	6 or 10 hrs				(Arrange)		305 N. H.	Hottes

SECOND SEMESTER

Botany 9b *3 or 5 — Schedule same as for 9a (first semester).

10a-10b. Current Botanical Literature.—A weekly review covering the field of botany; supplementary to the various seminar conferences. *I, II; (1).*

Prerequisite: Concurrent taking of some course in botany open for graduate credit.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	10a	1	—	—	—	—	4	—	229 N.H.	Trelease Hottes Stevens Hague McDougall

SECOND SEMESTER

Botany 10b 1 — Schedule the same as for 1a (first semester).

14a-14b. Heredity, Variation, Evolution.—The cells and members of plants, their adaptations and changes, the mechanism of heredity, and the process of evolution. *I, II; (3).*

Prerequisite: 10 hours of botany, and junior standing.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	14a	3	Lecture	—	11	—	11	—	229 N. H.	Hottes
			Laboratory		2 hrs	(Arrange)			204 N. H.	Hottes

SECOND SEMESTER

Botany 14b 3 — Schedule the same as for 14a (first semester).

16a-16b. Taxonomy and Ecology of Thallophytes.—Advanced practise on selected groups: (1) Algæ and Bryophytes; (2) Fungi. *I, II; *(3 or 5).*

Prerequisite: 10 hours of botany, including either course 2a or 4b for Algæ and Bryophytes, or 4c or 7a for Fungi, and junior standing.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	16a *3 or 5	Laboratory	6 or 10 hrs.				(Arrange)		(1) 306 N. H. (2) Botany Annex	Hague Stevens

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 3-5, but, 3, or 4, or 5.

Botany

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	16b *3 or 5	—	Schedule the same as for 16a (first semester).							

17a-17b. Taxonomy and Ecology of Cormophytes.—Advanced practise on selected taxonomic, ecological, or economic groups. Genera or families of Illinois plants, ecological association or adaptations, or plants economically important as weeds, forest resources, adjuncts to medicine, farm, orchard, or garden crops, or as the basis of floriculture, landscape architecture, street shading, or other decorative planting. *I, II; *(3 or 5).*

Prerequisite: 10 hours of botany, including course 4a, and junior standing.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	17a *3 or 5	Laboratory				6 or 10 hrs.		(Arrange)	304 N. H.	Trelease

SECOND SEMESTER

Botany	17b *3 or	—	Schedule the same as for 17a (first semester).							
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22a. Morbid Histology.—The parasites of plant tissues and their histology in condition of disease. *I; *(3 or 5).*

Prerequisite: Botany 3a and 7a or 7b, and junior standing.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	22a *3, or 5	Laboratory				6 or 10 hrs	(Arrange)		Botany Annex	Stevens

22b. Groups of Fungi and Crop Diseases.—*II; *(3 or 5).*

Prerequisite: 10 hours of botany, including 7a, or 7b, and junior standing.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	22b *3 or 5	Laboratory				6 or 10 hrs	(Arrange)		Botany Annex	Stevens

Courses for Graduates

101. Cytology.—The influence of external agents on the cell. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *I, II; (1 or 2 units). Time to be arranged.*
Professor HOTTES

102. Physiology.—The effects of external stimuli on growth and movement. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *I, II; (1 or 2 units). Time to be arranged.*
Professor HOTTES

104. Mycology.—Fungi. Individual assignments of subjects and problems in field and laboratory. *I, II; (1 or 2 units). Time to be arranged.*
Professor STEVENS

106. Plant Pathology.—Diseases of plants, and disease agents. Special subjects are assigned upon consultation. *I, II; (1 or 2 units). Time to be arranged.*
Professor STEVENS

108. Taxonomy.—Monographic studies of critical groups. *I, II; (1 or 2 units). Time to be arranged.*
Professor TRELEASE

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Business Organization and Operation

B. BACTERIOLOGY

(See COURSES LISTED SEPARATELY.)

BUSINESS LAW

(See BUSINESS ORGANIZATION and OPERATION.)

BUSINESS ORGANIZATION AND OPERATION

(Including ACCOUNTANCY and BUSINESS LAW.)

LEWIS EMANUEL YOUNG, Ph.D., *Assistant Professor*

WILLIAM ARTHUR CHASE, LL.M., C.P.A., *Lecturer, in charge of work in Accountancy*

ROBERT ENOCH HIERONYMUS, A.M., LL.D., *Community Adviser; lecturer on commercial and civic organizations*

HIRAM THOMPSON SCOVILL, A.B., *Instructor*

HARRISON MCJOHNSTON, A.M., *Instructor*

WILLIAM B CASTENHOLZ, A.M., *Instructor*

ANANIAS CHARLES LITTLETON, A.B., *Instructor*

A. ACCOUNTANCY

Courses for Undergraduates

1a-1b. Principles of Accounting.—Principles of accounting and their application in the art of bookkeeping. Accounting procedure from single to double entry, from individual accounts to partnership, corporation, and other accounts. Credit for graduation is not given for either semester separately. *I, II; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	1a	3	A, Discussion	2	—	—	—	—	—	308 Com.	Chase
			B, Discussion	2	—	—	—	—	—	312 Com.	Scovill
			C, Discussion	3	—	—	—	—	—	308 Com.	Scovill
			D, Discussion	—	—	1	—	—	—	312 Com.	Littleton
			E, Discussion	—	—	—	1	—	—	312 Com.	Littleton
			F, Discussion	—	—	—	—	1	—	312 Com.	Littleton
			A, Practise	—	2,3	—	2,3	—	—	303 Com.	Littleton
			B, Practise	—	—	2,3	—	2,3	—	303 Com.	Scovill
			C, Practise	—	8,9	—	8,9	—	—	303 Com.	Scovill
			D, Practise	—	—	8,9	—	8,9	—	303 Com.	Littleton
			E, Practise	—	10,11	—	10,11	—	—	303 Com.	Littleton
			F, Practise	—	—	10,11	—	10,11	—	303 Com.	Littleton

SECOND SEMESTER

Accountancy 1b 3 Sections and schedule the same as for 1a (first semester).

2a-2b. Advanced Accounting and Auditing.—Application of the principles of course 1a-1b to problems in accounting, the valuation of good will, depreciation, sinking funds, investments, partnership, adjustments, and resources. Credit is not given for either semester separately. *I, II; (3).*

Prerequisite: Accountancy 1a-1b; Economics 7 or 26, 22 or 27; and registration or credit in Economics 1.

Business Organization and Operation

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	2a	3	Lecture	—	2	—	—	—	—	204 Com.	Chase
			A, Discussion	1	—	1	—	—	—	307 Com.	Scovill
			B, Discussion	—	1	—	1	—	—	307 Com.	Scovill

SECOND SEMESTER

Accountancy 2b 3 Sections and schedule the same as for 2a (first semester).

3a-3b. Accounting Problems and Auditing.—Must be taken throughout the year in order to secure credit. *I, II; (3).*

Prerequisite: Accountancy 2a-2b, Economics 3, and credit or registration in Business Organization and Operation 1 and 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	3a	3	—	1	1	—	—	—	—	312 Com.	Chase

SECOND SEMESTER

Accountancy 3b 3 — Schedule the same as for 3a (first semester).

4a-4b. Cost Accounting.—(a) Cost accounting applied to factory procedure, overhead expense, the installation and control of cost systems, presentation of cost data; (b) cost accounting as a basis for manufacturing efficiency; (c) the construction of cost systems. *I, II; (3).*

Prerequisite: Accountancy 1a-1b, Economics 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	4a	3	—	8	—	8	—	8	—	101 Com.	Castenholz

SECOND SEMESTER

Accountancy 4b 3 — Schedule same as for 4a (first semester).

10. Shop Management and Shop Cost Records.—Cooperation between shop and cost departments; preparation and use of cost records; estimation of costs on contracts and calculation of profits. *II; (2).*

Prerequisite: Open only to students in engineering who have had Economics 1 or 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	10	2	—	—	10	—	10	—	—	308 Com.	Scovill

11. Farm Accounting.—The principles of accounting and distribution of costs as applied to farm operations; proper investment of funds. *I; (3).*

Prerequisite: Open only to students in agriculture who have had Economics 1 or 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	11	3	Discussion	—	—	—	—	1	—	307 Com.	Scovill
			Practise	—	2,3	—	2,3	—	—	202 Com.	Scovill

12. Commercial Administrative Accounting.—Accounts of corporations and partnerships; tabular bookkeeping; accounts of branches; adjustment accounts; organization of accounts; application and allotments; reserves and

Business Organization and Operation

depreciation; expenses; profits; dividends; income tax; balance sheets; the interpretation of accounts. *I*; (2).

Prerequisite: Accountancy 1a-1b, Economics 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	12	2	—	11	11	—	—	—	—	312 Com.	Chase

13. Municipal Accounting.—Municipal balance sheets and revenue accounts, cash book, journal, ledger, subsidiary books and rolls, passing accounts, warrants, vouchers, striking the rate, school accounts, bonds and sinking funds, budgets. *II*; (2).

Prerequisite: Accountancy 1a-1b, Economics 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	13	2	—	11	11	—	—	—	—	312 Com.	Chase

B. BUSINESS ORGANIZATION AND OPERATION

Courses for Undergraduates

1. Business Organization and Operation.—Individual proprietorship, partnership, and corporation; the process of organizing a business; organization for operation and the reaction of form of organization on efficiency; gradation and interrelation of divisions and departments; departmental responsibility and authority, routine, and discipline. *I*; (3).

Prerequisite: Economics 1 and Accountancy 2a-2b. For the present year students who have had Accountancy 1a-1b may be admitted on application to the instructor.

NOTE: The course is not open to students who have had the former Economics 6.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	1	3	—	3	—	3	—	3	—	204 Com.	Young

2. Organization and Control of Mercantile Distribution.—Typical distributive businesses; organization and administration of wholesale and retail establishments and commission houses. Cooperation in buying and selling; trade marks and patents; shipping combinations; trade agreements. *II*; (3).

Prerequisite: Business Organization and Operation 1 or, for the present year, former Economics 6.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	2	3	—	3	—	3	—	3	—	204 Com.	Young

3. Business Procedure.—Conventional business practises; cash and trade discounts; commissions; interest and discounts; forms and uses of checks, notes, drafts, and other instruments of credit and exchange; the rules

Business Organization and Operation

and procedure of banking institutions; mercantile and credit agencies. Office organization and management. *I*; (2).

Prerequisite: Business Organization and Operation 2. For the present year Economics 10 and Accountancy 1a-1b will be accepted instead of Business Organization and Operation 2. Senior engineering students who have had Economics 1 or 2 may be admitted by permission of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Business Organization and Operation	3	2	—	—	3	—	3	—	—	204 Com. Young

4. Industrial Organization and Management.—Problems of organization and of administrative policy; supervision and management of industries and industrial units. Relations to labor, the community and law. *II*; (2).

Prerequisite: Business organization and Operation 2. For the present year Economics 10 and Accountancy 1a-1b will be accepted instead of Business Organization and Operation 2. Senior engineering students who have had Economics 1 or 2 may be admitted by permission of the instructor.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Business Organization and Operation	4	2	—	—	3	—	3	—	—	204 Com. Young

7. Salesmanship.—Policies and practise of modern sales organizations; selling problems of manufacturers, wholesalers, and retailers; management of salesmen; the practise of individual salesmen. *I*; (3).

Prerequisite: Economics 1 and Business Organization and Operation 1. For the present year former Economics 6 will be accepted in place of Business Organization and Operation 1.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Business Organization and Operation	7	3	—	8	—	8	—	8	—	312 Com. McJohnston

8. Advertising.—Principles and current practise; cooperation of advertising and personal selling; special problems; planning sales campaigns; choice of media; space buying; and practise in writing copy. *II*; (3).

Prerequisite: Business Organization and Operation 7.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Business Organization and Operation	8	3	—	8	—	8	—	8	—	312 Com. McJohnston

9. Commercial and Civic Organizations.—For students preparing for positions as secretaries of commercial or agricultural associations, civic or welfare clubs, and similar organizations. The history of trade and similar organizations; methods of organization; expansion and promotion; the relation of such associations to the life and welfare of the community and to one another; pro-

Ceramic Engineering

motion of community welfare by common action; work and duties of the secretary and other officers; the legal status and recent results. *II*; (1).

Prerequisite: Economics 1 and Business Organization and Operation 2 (for the present year former Economics 6 will be accepted instead of Business Organization and Operation 2); or Economics 2 and Farm Management 1; or Economics 1, Political Science 4, and Sociology 8.

SECOND SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Business Organization and Operation	9	1	—	11	—	—	—	—	101 Com.	Hieronimus

C. BUSINESS LAW

Courses for Undergraduates

1a-1b. Commercial Law.—Principles underlying the law of contracts, negotiable instruments, agency, partnerships, business corporations, sales of personal property, bailments and carriers, guaranty and suretyship, and insurance. *I, II*; (3).

Prerequisite: Sixty hours of University credit, including Economics 1 and Accountancy 1a-1b.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Business Law	1a	3	A	1	—	1	—	1	—	204 Com.	Young
			B	2	—	2	—	2	—	204 Com.	Young

SECOND SEMESTER

Business Law 1b 3 Schedule and sections the same as for 1a (first semester).

2. Elementary Law.—Contracts, leases, landed property, etc. Open to junior and senior students in Agriculture only. *II*; (3).

Prerequisite: Economics 2.

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Business Law	2	3	—	1	—	1	—	1	—	101 Com.	—

CERAMIC ENGINEERING

RALPH KENT HURSH, B.S., *Associate*

BARNEY S RADCLIFFE, M.S., *Instructor*

ARTHUR EDWARDS WILLIAMS, B.S., *Instructor*

RALPH RAYMOND DANIELSON, B.S., *Assistant*

The courses offered by the department of ceramic engineering are designed to give a technical knowledge of the composition and properties of materials used in the manufacture of claywares, cements, glasses, and enamels, and to acquaint the student with the construction, equipment, and operation of ceramic plants.

Graduates of courses other than ceramic engineering who have the necessary prerequisites may take the following courses for minor credit: 3, 5, 6, 8, 10, 13, 14, 15, and 16.

Ceramic Engineering

Courses for Undergraduates

1. **Ceramic Materials.**—The properties of clays and other ceramic materials; the identification of the varieties met in practical work. Lectures, laboratory. *II*; (3).

Prerequisite: Chemistry 2, 3, or 2a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	1	3	—	1	—	1	—	1-4	—	Cer.	Williams

2. **Winning and Preparation of Clays.**—Machinery and processes used in preparing clays for market or manufacture; cost data. *I*; (3).

Prerequisite: Chemistry 5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	2	3	—	9	—	9	—	9	—	Cer.	Radcliffe

3. **Industrial Calculations.**—Chemical and physical calculations applying to the operation of furnaces, kilns, and dryers; temperature measurements; ceramic stoichiometry. *I*; (3).

Prerequisite: Mathematics 7 or 8; Chemistry 5b; Physics 1a-1b and 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	3	3	—	—	8	—	8	—	8	Cer.	Hursh

4. **Drying and Burning.**—Clay wares; types of construction of industrial dryers and kiln plants; chemical and physical processes involved. *I*; (4).

Prerequisite: Ceramic Engineering 1, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	4	4	—	9	9	9	9	—	—	Cer.	Williams

5. **Ceramic Bodies.**—Composition and properties of ceramic body mixtures; effects of various ingredients; development of special bodies. Lectures; laboratory. *II*; (5).

Prerequisite: Ceramic Engineering 1, 2, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	5	5	Lecture	—	8	—	8	8	—	Cer.	Radcliffe
			Laboratory	1-4	—	1-4	—	—	—	Cer.	Radcliffe

6. **Glazes.**—Production of glazes and enamels; limits of composition; classification; properties and defects common to each class; effect of variation in composition; modes of application. Lectures; laboratory. *I*; (5).

Prerequisite: Ceramic Engineering 3, 4, 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	6	5	Lecture	1	—	1	—	—	—	Cer.	—
			Laboratory	2-5	—	2-5	—	2-5	—	Cer.	Danielson

8. **Glass.**—Raw materials, preparation, compounding, melting, and shaping; chemical principles involved in the manufacture and decoration of the various types of vitreous silicates. Lectures. *II*; (2).

Prerequisite: Ceramic Engineering 3, 4, 5, 6.

Ceramic Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	8	2	—	9	—	9	—	—	—	Cer.	—

9. Ceramic Construction.—Plans, specifications, and estimates for ceramic equipments and industrial plants. *II*; (4).

Prerequisite: G. E. D. 2; Ceramic Engineering 3, 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	9	4	—	1-4	—	1-4	—	1-4	9-12	Cer.	Hursh

10. Cements.—Cements, limes, plasters; composition; reactions; methods of manufacture and testing. *I*; (3).

Prerequisite: Ceramic Engineering 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	10	3	—	—	11	—	11	9	—	Cer.	Hursh

11. Thesis.—*II*; (5).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	11	5	—				(Arrange)			Cer.	Hursh

12. Designing and Shaping.—The standpoint of the manufacturer; die construction; templates; master and working molds for pressing, casting, and jiggering. *II*; (3).

Prerequisite: Ceramic Engineering 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	12	3	—	8-12	—	8-12	—	—	—	Cer.	Radcliffe

13. Cement Laboratory.—Preparation of cementing substances, study of properties and reactions involved. *II*; (3).

Prerequisite: Ceramic Engineering 10.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	13	3	—				(Arrange)			Cer.	Hursh

14. Cement Laboratory.—The production of waterproof and sea resisting cements; cement colloids; polychrome pigments for fresco decoration; cement colors; cold water paints. *II*; (3).

Prerequisite: Ceramic Engineering 10.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	14	3	—				(Arrange)			Cer.	Hursh

15. Glass Laboratory.—Soda-lime, potash-lime, lead, barium, and zinc silicates; boro-silicates; properties of fused and solidified glasses; practical glass problems. *I*; (3).

Prerequisite: Ceramic Engineering 6, 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	15	3	—				(Arrange)			Cer.	—

Ceramic Engineering

16. Glasses and Enamels.—(Continuation of Ceramic Engineering 15). Opaque, colored, and optical glasses; enameling of metals. *II*; (3).

Prerequisite: Ceramic Engineering 15.

SECOND SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Cer. E.	16	3	—					(Arrange)		Cer.
										<i>Instructor</i>

17. Silicates.—Formation and properties; experimental methods. *II*; (3).

Prerequisite: Ceramic Engineering 1, 3.

SECOND SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Cer. E.	17	3	—					(Arrange)		Cer.
										<i>Instructor</i>

Courses for Graduates

Registration in graduate courses in ceramic engineering presupposes full under-graduate work in the subject or sufficient training in allied subjects to warrant the expectation that the student will be able to do the work elected.

101. The Formation of Silicates.—Theoretical principles involving the conceptions of physical chemistry; thermal studies. *I*; (1 to 2 units). *Time to be arranged.*

102. Technology of the Clay Industries.—Mineralogical constitution of clays; plasticity and the colloidal state; pyro-chemical and physical changes; composition and constitution of bodies, glazes, and enamels. *II*; (1 to 2 units). *Time to be arranged.*

103. Technology of Cements.—Composition and constitution of cements; hydration and dehydration of cementing compounds; action of catalyzers. *II*; (1 to 2 units). *Time to be arranged.*

104. Technology of Glass.—Fusion studies of glassy silicates; limiting compositions; physical and chemical properties of glasses. *II*; (1 to 2 units). *Time to be arranged.*

CHEMISTRY

WILLIAM ALBERT NOYES, Ph.D., LL.D., *Professor and Director*

SAMUEL WILSON PARR, M.S., *Professor*

HARRY SANDS GRINDLEY, D.Sc., *Professor*

EDWARD BARTOW, Ph.D., *Professor*

CLARENCE WILLIAM BALKE, Ph.D., *Professor*

EDWARD WIGHT WASHBURN, Ph.D., *Professor*

DAVID FORD MCFARLAND, Ph.D., *Assistant Professor*

GEORGE MCPHAIL SMITH, Ph.D., *Assistant Professor*

CLARENCE GEORGE DERICK, Ph.D., *Assistant Professor*

HENRY CHARLES PAUL WEBER, Ph.D., *Assistant Professor*

DUNCAN ARTHUR MACINNES, Ph.D., *Associate*

GEORGE DENTON BEAL, Ph.D., *Associate*

B SMITH HOPKINS, Ph.D., *Associate*

HOWARD BISHOP LEWIS, Ph.D., *Associate*

HENRY JOHN BRODERSON, Ph.D., *Instructor*

CHARLES HENRY HECKER, Ph.D., *Instructor*

GEORGE WALLACE SEARS, Ph.D., *Instructor*
 HUBERT LEONARD OLIN, Ph.D., *Instructor*
 EDWARD OTTO HEUSE, Ph.D., *Instructor*
 JESSIE YEREANCE CANN, Ph.D., *Instructor*
 HARRY PEACH CORSON, Ph.D., *Instructor*
 OLIVER KAMM, Ph.D., *Instructor*
 RAYMOND WASHINGTON HESS, A.B., *Assistant*
 HARRY CLEVELAND KREMERS, M.S., *Assistant*
 ERNEST EDWARD CHARLTON, M.S., *Assistant*
 EDWIN ARTHUR REES, A.M., *Assistant*
 ROSS EARLBY GILMORE, A.M., *Assistant*
 SILAS ALONZO BRALEY, M.S., *Assistant*
 RALPH WALDO TIPPET, A.M., *Assistant*
 HENRY LESTER GERRY, A.M., *Assistant*
 GLENN SEYMOUR SKINNER, A.M., *Assistant*
 JAY THOMAS FORD, A.B., *Assistant*
 TERRENCE ONAS WESTHAEFER, A.B., *Assistant*
 CARL NATHAN DAVIDSON, A.B., *Assistant*
 DON WARREN BISSELL, B.S., *Assistant*
 WALTER GERALD KARR, B.S., *Assistant*
 ERNEST HENRY VOLLWEILER, A.B., *Assistant*
 FRANK F FOOTITT, A.B., *Assistant*
 JOSEPH MARVIN BRAHAM, M.S., *Assistant*
 ALBERT WAFFLE OWENS, B.S., *Assistant*
 SIDNEY MARION HULL, B.S., *Assistant*
 FLOYD ELBA ROWLAND, A.M., *Assistant*
 PAUL ANDERS, *Assistant, Glass Blowing*
 ALBERT DURAND SHEPARD, B.S., *Graduate Assistant*
 HARRY GLENN PORTZ, B.S., *Graduate Assistant*
 HENRY RHODES LEE, A.B., *Graduate Assistant*
 ALFRED MARTIN HEINZELMANN, B.S., *Graduate Assistant*
 JAMES KEEL REED, A.B., *Graduate Assistant*
 RUTH ELIZA OKEY, M.S., *Graduate Assistant*
 HERBERT AUGUST WINKELMANN, B.S., *Graduate Assistant*
 LLOYD HILTON REYERSON, B.S., *Graduate Assistant*
 HARRY JAMES BEATTIE, A.M., *Graduate Assistant*
 MARY VANRENSSELAER BUELL, A.B., *Graduate Assistant*
 LEONARD FRANCIS YNTENA, A.B., *Graduate Assistant*
 RALPH WILLIAM HUFFORD, A.B., *Graduate Assistant*
 LORAN OGDAN POTTERF, A.M., *Graduate Assistant*
 ALFRED RICHARD POWELL, A.M., *Graduate Assistant*
 LANSING SADLER WELLS, B.S., *Graduate Assistant*
 WILLIAM ALEXANDER VANWINKLE, B.S., *Graduate Assistant*
 DEWITT OWEN JONES, B.S., *Graduate Assistant*
 HELEN UPDEGRAFF, B.S., *Graduate Assistant*
 WILLIAM ROBERT BRUCE, A.B., *Graduate Assistant*
 LOUIS JORDAN, A.B., *Graduate Assistant*
 MARGARET CAMPBELL PERRY, A.B., *Graduate Assistant*

Major: 20 hours, exclusive of chemistry 1, 1a, 1b, 4 and 16, and inclusive of courses in quantitative analysis and organic chemistry.

Chemistry

Minors: 20 hours, chosen from bacteriology, botany, geology, mathematics, philosophy, physiology, physics, and zoology.

Students taking chemistry at the University are advised to give at least one year to the subject, and this should include Chemistry 1 or 1a, 2, and 3. Those continuing in the second year should take Chemistry 5a and 5b, 5c or 13a. In the third year Chemistry 14 or 9, 9a, and 9b, or 9c, 31, and 33 should be taken. With these, more special courses may be taken if desired, but, in general, students are not advised to take the special courses unless they have had the fundamental work represented by the selection given above. Students who desire a training for professional work in chemistry, either as teachers or in its industrial applications, will naturally take the chemical course or the course in chemical engineering.

Students who find it impossible to take more than one semester's work are requested to register for Chemistry 1 or 1a in the second semester rather than in the first.

1. Inorganic Chemistry.—The non-metallic elements. Noyes's *Text-book of Chemistry. I or II*; (5).

Professor BALKE in charge.

NOTE: Students who have credit for high school chemistry should register for chemistry 1a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1	5	A, Lecture	—	11	—	11	—	—	100 Ch.	Noyes
			B, Lecture	—	2	—	2	—	—	100 Ch.	Balke
			A, Quiz	8	—	8	—	—	—	Rooms to be posted at begin- ning of semester	Balke Hopkins Hecker Sears Cann and Assistants
			B, Quiz	11	—	11	—	—	—		
			C, Quiz	2	—	2	—	—	—		
			D, Quiz	—	8	—	8	—	—		
			E, Quiz	—	10	—	10	—	—		
			F, Quiz	—	1	—	1	—	—		
			A, Laboratory	8,9	—	8,9	—	8,9	—	—	
			B, Laboratory	10,11	—	10,11	—	10,11	—	—	
			C, Laboratory	—	10,11	—	10,11	—	10,11	—	
			D, Laboratory	1,2	—	1,2	—	1,2	—	—	
SECOND SEMESTER											
			Lecture	—	11	—	11	—	—	100 Ch.	Balke
			A, Quiz	11	—	11	—	—	—	*	Balke Hecker Sears
			B, Quiz	—	8	—	8	—	—	*	
			C, Quiz	—	10	—	10	—	—	*	
			A, Laboratory	8,9	—	8,9	—	8,9	—	*	
			B, Laboratory	10,11	—	10,11	—	10,11	—	*	

* Rooms to be posted at beginning of semester.

1a. Inorganic Chemistry.—Lectures; recitations; laboratory. For students who have had one year of high school chemistry. *I or II*; (3).

Professor BALKE in charge.

Prerequisite: One year of entrance chemistry. Students whose preparation proves to be inadequate for continuing this course will be required to change their registration to Chemistry 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1a	3	C, Lecture	—	9	—	—	—	—	100 Ch.	Balke
			D, Lecture	—	—	—	—	11	—	100 Ch.	Balke
			G, Quiz	9	—	9	—	—	—		
			H, Quiz	10	—	—	—	10	—		
			I, Quiz	11	—	11	—	—	—		
			J, Quiz	11	—	—	—	11	—		
			K, Quiz	3	—	3	—	—	—		
			L, Quiz	—	8	—	8	—	—		
			M, Quiz	—	10	—	10	—	—		
			N, Quiz	—	1	—	1	—	—		
			O, Quiz	—	—	8	—	8	—	Rooms to be posted at beginning of semester	
			P, Quiz	—	—	1	—	1	—		
			E, Laboratory	8,9	—	—	—	—	—		Balke
			F, Laboratory	—	10,11	—	—	—	—		Hopkins
			G, Laboratory	—	—	—	8,9	—	—		Hecker
			H, Laboratory	—	—	—	10,11	—	—		Sears
			I, Laboratory	—	—	—	—	8,9	—		Cann
			J, Laboratory	—	—	—	—	—	10,11		
			K, Laboratory	1,2	—	—	—	—	—		
			L, Laboratory	—	1,2	—	—	—	—		
			M, Laboratory	—	3,4	—	—	—	—		
			N, Laboratory	—	—	1,2	—	—	—		
			O, Laboratory	—	—	—	1,2	—	—		
			P, Laboratory	—	—	—	3,4	—	—		
			Q, Laboratory	—	—	—	—	1,2	—		

SECOND SEMESTER

			Lecture	—	—	—	—	11	—	100 Ch.	Balke
			E, Quiz	10	—	10	—	—	—	Rooms to be posted at beginning of semester	
			F, Quiz	11	—	11	—	—	—		
			G, Quiz	—	10	—	10	—	—		Balke
			E, Laboratory	—	8,9	—	—	—	—		Hopkins
			F, Laboratory	—	—	—	10,11	—	—		Hecker
			G, Laboratory	—	—	—	—	8,9	—		Sears
			H, Laboratory	—	—	—	—	—	10,11		Cann
			I, Laboratory	—	—	—	1,2	—	—		

1b. Inorganic Chemistry.—Lectures; recitations; laboratory. (For students in engineering.) *I* or *II*; (4).

Professor BALKE in charge.

NOTE: Students who have credit for high school chemistry should register for chemistry 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1b	4	A, Lecture	—	11	—	11	—	—	100 Ch.	Noyes
			B, Lecture	—	2	—	2	—	—	100 Ch.	Balke
			R, Quiz	9	—	9	—	—	—		
			S, Quiz	10	—	—	—	10	—		
			T, Quiz	11	—	—	—	11	—		
			U, Quiz	—	—	8	—	8	—		
			V, Quiz	—	—	1	—	1	—	Rooms to be posted at beginning of semester	
			R, Laboratory	8,9,10	—	—	—	—	—		Balke
			S, Laboratory	8,9,10	—	—	—	—	—		Hopkins
			T, Laboratory	—	—	—	8,9,10	—	—		Hecker
			U, Laboratory	—	—	—	—	8,9,10	—		Sears
			V, Laboratory	—	—	—	—	—	8,9,10		Cann
			W, Laboratory	—	—	—	—	—	9,10,11		
			X, Laboratory	1,2,3	—	—	—	—	—		
			Y, Laboratory	—	—	1,2,3	—	—	—		
			Z, Laboratory	—	—	—	1,2,3	—	—		
			ZZ, Laboratory	—	—	—	—	1,2,3	—		

Chemistry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1b	4	Lecture	—	11	—	11	—	—	100 Ch.	Balke
			L, Quiz	11	—	11	—	—	—	Rooms to be posted at begin- ning of semester	Balke Hecker Sears
			M, Quiz	—	9	—	9	—	—		
			N, Quiz	—	10	—	10	—	—		
			L, Laboratory	—	8,9,10	—	—	—	—		
			M, Laboratory	—	—	1,2,3	—	—	—		
			N, Laboratory	—	—	—	1,2,3	—	—		

2a. Inorganic Chemistry and Qualitative Analysis.—The general chemistry and qualitative analysis of the more common metals and inorganic compounds. Lectures; recitations; laboratory. *I* or *II*; (5).

Professor BLAKE in charge.

Prerequisite: Chemistry 1 or 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	2a	5	Lecture	—	—	9	—	9	—	100 Ch.	Weber
			Quiz	—	—	8	—	8	—	*	
			Laboratory	—	8,9	—	8,9	—	8,9	*	

*Rooms to be posted at beginning of semester.

SECOND SEMESTER

A, Lecture	—	9	—	9	—	—	100 Ch.	Weber
B, Lecture	—	10	—	10	—	—	100 Ch.	Balke
A, Quiz	8	—	8	—	—	—	Rooms to be posted at begin- ning of semester	Balke Weber Hopkins Hecker Sears Cann
B, Quiz	10	—	10	—	—	—		
C, Quiz	11	—	11	—	—	—		
D, Quiz	—	8	—	8	—	—		
E, Quiz	—	10	—	10	—	—		
F, Quiz	—	11	—	11	—	—		
G, Quiz	—	1	—	1	—	—		
H, Quiz	—	2	—	2	—	—		
I, Quiz	—	3	—	3	—	—		
J, Quiz	—	—	9	—	9	—		
K, Quiz	—	—	1	—	1	—		
A, Laboratory	8,9	—	8,9	—	8,9	—		
B, Laboratory	—	8,9	—	8,9	—	8,9		
C, Laboratory	10,11	—	10,11	—	10,11	—		
D, Laboratory	1,2	—	1,2	—	1,2	—		
E, Laboratory	—	1,2	—	1,2	—	10,11		

3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. *I* or *II*; (6).

Prerequisite: Chemistry 1 or 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	3a	6	(Arrange)							321 Ch.	Balke

SECOND SEMESTER

A, Lecture	—	10	—	10	—	—	100 Ch.	} Balke
A, Quiz	10	—	10	—	—	—	*	
Laboratory	1-4	—	1-4	—	1-4	—	*	

*Rooms to be posted at beginning of semester

4. Qualitative Analysis and Chemistry of the Metallic Elements.—Class and laboratory work. (For students in engineering.) *I* or *II*; (4).

Dr. WEBER in charge.

Prerequisite: Chemistry 1a or 1b.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	4	4	A, Quiz	2	—	—	—	2	—	319 Ch.	Weber
			B, Quiz	—	8	—	8	—	*		
			C, Quiz	—	11	—	11	—	*		
			A, Laboratory	—	1,2,3	—	1,2,3	—	*		
			B, Laboratory	—	—	1,2,3	—	1,2,3	—	*	

*Rooms to be posted at beginning of semester

SECOND SEMESTER									
A, Quiz	8	—	8	—	—	—	319 Ch.	Weber	
B, Quiz	9	—	9	—	—	—			
C, Quiz	10	—	10	—	—	—			
D, Quiz	11	—	11	—	—	—			
E, Quiz	2	—	2	—	—	—	Rooms		
F, Quiz	—	9	—	9	—	—	to be	Weber Hopkins Cann Sears Cann	
G, Quiz	—	10	—	10	—	—	posted		
H, Quiz	—	11	—	11	—	—	at		
I, Quiz	—	2	—	2	—	—	begin-		
A, Laboratory	8,9	—	8,9	—	8,9	—	ning		
B, Laboratory	—	8,9	—	8,9	—	8,9	of		
C, Laboratory	—	10,11	—	10,11	—	10,11	semester		
D, Laboratory	1,2,3	—	—	—	1,2,3	—			
B, Laboratory	—	—	1,2,3	—	1,2,3	—			

5a. Elementary Quantitative Analysis.—Gravimetric and volumetric analysis; stoichiometrical relations and the application of the fundamental laws of chemistry to quantitative analysis. Lectures; recitations; laboratory. Talbot's *Quantitative Chemical Analysis*. I or II; (5).

Assistant Professor SMITH in charge.

Prerequisite: Chemistry 2, 3, or 2a.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	5a	5 A, Lecture	—	9	—	9	—	—	217 Ch.	Smith	
		A, Laboratory	—	1,2,3	—	1,2,3	—	8-12	218 Ch.	Smith	
		B, Lecture	—	9	—	9	—	—	—	—	
		B, Laboratory	1,2,3	—	1,2,3	—	1,2,3	—	218 Ch.	Smith	
				SECOND SEMESTER							
)			Lecture	—	9	—	9	—	—	217 Ch.	Olin
			Laboratory	—	1,2,3	—	1,2,3	—	8-12	216 Ch.	Olin

5b. Quantitative Analysis.—Continuation of 5a. The analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; recitations; laboratory. Treadwell-Hall: *Analytical Chemistry*, Vol. II. II; (5).

Prerequisite: Chemistry 5a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5b	5	Lecture	—	9	—	9	—	—	217 Ch.	Smith
			Laboratory	—	1,2,3	—	1,2,3	—	8-12	218 Ch.	Smith

5c. Food Analysis.—Quantitative organic analysis, with special reference to the examination of food products: alcohols, carbohydrates, fats and oils, cereals, nitrogenous bodies, preservatives, and colors. Sherman's *Organic Analysis*; Sherman's *Food Products*; "Bulletin 107, rev., U. S. Bureau of Chemistry." II; *(3 to 5).

Prerequisite: Chemistry 5a or 13a; 9 or 14a-14b.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e, g., not 2-5, but 2, or 3, or 4, or 5.

Chemistry

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5c	*3 to 5	Lecture	—	10	—	10	—	111 Ch.	Beal
			Laboratory	1,2,3	—	1,2,3	—	1,2,3	216 Ch.	Beal

6†. **Chemical Technology.**—Technological chemistry as illustrated in those industries having a chemical basis for their principal operations and processes; trade journals. Lectures; recitations. Rogers and Aubert's *Industrial Chemistry*. II; (3).

Prerequisite: Chemistry 5a and 14a-14b.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	6	3	—	11	—	11	—	11	111 Ch.	McFarland

7†. **Metallurgy.**—General metallurgy; metallurgy of iron and steel. Lectures; assigned reading; recitations. Fulton's *Principles of Metallurgy*; Stoughton's *Iron and Steel*. I; (3).

Prerequisite: Chemistry 5a. (Senior students in engineering courses may be admitted to this course by special arrangement, without this prerequisite).

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	7	3	—	11	—	11	—	11	111 Ch.	McFarland

7a. **Metallurgy of the Non-Ferrous Metals.**—Copper, lead, zinc, gold, and silver. II; (3).

Prerequisite: Chemistry 5a or 13a.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	7a	3	—	—	—	—	—	—	Ch.	McFarland

9. **Organic Chemistry.**—The characteristics of the more typical and simple organic compounds; the important classes of derivatives of carbon. (For students of the medical preparatory and household science courses and others desiring a short course.) II; (3).

Prerequisite: Chemistry 3.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9	3	—	8	—	8	—	8	217 Ch.	Derick

9a. **Organic Synthesis and Ultimate Analysis.**—Ultimate organic analysis; preparation of typical organic compounds. Laboratory. I or II; (2).

Prerequisite: Registration in Chemistry 14a-14b, or equivalent.

EITHER SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9a	2	A	1,2,3	—	1,2,3	—	—	219 Ch.	Derick
			B	—	1,2,3	—	1,2,3	—	219 Ch.	Kamm

9b. **Organic Synthesis and Qualitative Organic Analysis.**—Continuation of 9a, to accompany Chemistry 14b. I or II; (2).

Prerequisite: Chemistry 9a; registration in Chemistry 14b, or equivalent.

*In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

†Certain required inspection trips will be arranged in connection with courses 6 and 7. Students registered in these courses should take into consideration the expense involved, which will approximate \$15.00 for each course.

Chemistry

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9b	2	—	1,2,3	—	1,2,3	—	—	—	219 Ch.	Derick Kamm

9c. Organic Synthesis.—Typical organic compounds. Laboratory. (For students in the medical preparatory and household science courses and others desiring a brief course.) *II*; (2).

Prerequisite: Chemistry 3; registration in Chemistry 9, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9c	2	—	—	1,2,3	—	1,2,3	—	—	219 Ch.	Derick Kamm

10a. Water Chemistry.—The history, sources, contamination, and standards of purity of potable waters and waters for industrial purposes. Lectures; practise in analytical methods. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	10a	3	—	—	1-4	—	1-4	—	8-11	116 Ch.	Bartow Corson

10b. Water Chemistry.—(A modification of 10a to meet the requirements of students in sanitary engineering, registered in connection with Chemistry 2 and 3.) *II*; (1½).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	10b	1½	—	1-4	—	1-4	—	—	—	116 Ch.	Bartow Corson

11a-11b. Research.—Thesis, embodying a review of the literature of the subject; account of work done in the laboratory. The subject should be determined upon and reading begun in the junior year. A minimum of five semester hours is required. (Required for seniors.) *I, II*; (5).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	11a	5	—	—	—	—	—	—	—	—	Noyes in charge

SECOND SEMESTER

Chemistry	11b	5	—	—	—	—	—	—	—	—	Noyes in charge
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13a. Elementary Quantitative Analysis.—Gravimetric and volumetric analysis, fertilizer and milk analysis. Lectures; recitations; laboratory. Talbot's *Quantitative Chemical Analysis*. (For students in agriculture.) *I* or *II*; (5).

Assistant Professor SMITH in charge.

Prerequisite: Chemistry 2, 3, or 2a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	13a	5	Lecture	—	—	11	—	—	—	100 Ch.	Beal
			A, Lab. & Quiz	8-11	—	8-11	—	8-11	—	218 Ch.	
			B, Lab. & Quiz	—	8-12	—	8-12	—	8	218 Ch.	Olin
			C, Lab. & Quiz	—	1-4	—	1-4	—	8-11	218 Ch.	

Chemistry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	13a	5	Lecture	—	—	11	—	—	—	100 Ch.	Olin
			A, Lab. & Quiz	8-11	—	8-11	—	8-11	—	218 Ch.	} Olin Beal
			B, Lab. & Quiz	—	8-12	—	8-12	—	8	218 Ch.	
			C, Lab. & Quiz	1-4	—	1-4	—	1-4	—	218 Ch.	

13b. Advanced Agricultural Analysis.—The analysis of fungicides, limestone, phosphate rock, fuel, and water; determination of the alkali metals; special methods of agricultural analysis. Treadwell-Hall, *Analytical Chemistry*, Vol. II. (For students specializing in agricultural chemistry or agricultural experiments.) *II*; (5).

Prerequisite: Chemistry 5a or 13a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	13b	5	Lecture	1	—	1	—	—	—	103 Ch.	Beal
			Laboratory	2,3	—	2,3	—	1,2,3	—	216 Ch.	Beal

14a-14b. Organic Chemistry.—Lectures; recitations. Noyes's *Organic Chemistry*. *I*; (4); *II*; (2).

Prerequisite: Chemistry 5a; should be accompanied by Chemistry 9a and 9b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	14a	4	—	9	9	9	9	—	—	217 Ch.	Noyes

SECOND SEMESTER

Chemistry	14b	2	—	9	—	9	—	—	—	217 Ch.	Noyes
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15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic-digestion; intestinal digestion; bile; putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these topics treated thoroly for the prospective students of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Hammarsten's *Text Book of Physiological Chemistry*; Hawk's *Practical Physiological Chemistry*. (Open to graduates and undergraduates.) *I*; *(5 or 7).

Prerequisite: Two years' work in chemistry.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15 *5 or 7		Lecture	2	—	2	—	—	—	217 Ch.	Lewis
			Laboratory	—	1-4	—	1-4	1-4	—	219 Ch.	—

15a. Problems of Metabolism.—Colloids; animal oxidations; osmosis; absorption; selective activity of cells; metabolism; activities of gastro-intestinal tract; enzymes; inorganic nutrition. Lectures; demonstrations; conferences. *II*; (2).

Prerequisite: Chemistry 15.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15a	2	—	9	—	—	—	—	9	217 Ch.	Lewis

16. Chemistry for Engineers.—The proximate analysis of coal; determination of calorific power; technical analysis of furnace gases; examination of boiler waters; lubricating oils. (For mechanical engineers.) *II*; (3).

Prerequisite: Chemistry 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	16	3	Lecture	—	—	—	—	8	—	111 Ch.	Parr
			A,B, Laboratory	—	1-4	—	1-4	—	—		Broderson
			C, Laboratory	—	—	—	8-11	—	8-11		—

21. Qualitative Organic Analysis.—Systematic methods for identification of pure organic compounds and mixtures. *I* or *II*; (2).

Prerequisite: Chemistry 9a, 9b.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	21	2	A	—	1-4	—	1-4	—	—	219 Ch.	Derick
			B	1-4	—	1-4	—	—	—	219 Ch.	Kamm

22. Animal Chemistry (Animal Nutrition).—The chemical composition of animal products and feeding stuffs. Lectures; conferences; assigned reading; laboratory. *I* or *II*; (5).

Prerequisite: Two years' work in chemistry.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	22	5	—							558 Ag.	Grindley

(Arrange)

27. Qualitative Analysis of the Rare Elements.—The rare elements and their compounds; identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Assigned reading; laboratory. *II*; (3).

Prerequisite: Two years' work in chemistry.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	27	3	—							321 Ch.	Balke

(Arrange)

31. Elementary Physical Chemistry.—The more important principles of physical chemistry and electro-chemistry. Lectures; recitations; problems. *II*; (4).

Prerequisite: Chemistry 1, 2, 3; Physics 1a-1b or 7a-7b; Mathematics 7 or 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	31	4	—	10	—	10	—	10	10	111 Ch.	Washburn

33. Elementary Physical Chemistry.—Molecular weight of gases and solutions; chemical equilibrium; the electrical conductivity of solutions and the attendant phenomena within the solution; thermochemistry. (Laboratory to accompany course 31.) *II*; (2).

Prerequisite: Chemistry 5a; Physics 8a-8b or 3a-3b.

Chemistry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	33		2 A, Conference	—	8	—	—	—	—		MacInnes
			B, Conference	—	9	—	—	—	—		
			C, Conference	—	—	—	8	—	—		

Laboratory, 5 hours on either T, W, or T to be arranged.

35. Electrochemistry.—(A continuation of Chemistry 31. See also Chemistry 102b.) Theory and application. Lectures, recitations, laboratory. Allmand's *Applied Electrochemistry*. I; (3).

Prerequisite: Chemistry 31, 33.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	35	3	Lecture	—	11	—	11	—	—	114 Ch.	MacInnes
			A, Laboratory	1-4	—	—	—	—	—	128 Ch.	MacInnes
			B, Laboratory	—	—	1-4	—	—	—	128 Ch.	MacInnes

36. The Phase Rule and Its Applications.—A study of equilibria in heterogeneous systems. Lectures and seminar. II; (2).

Prerequisite: Chemistry 31, 33; Mathematics 8 or 7 and 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	36	2	—	—	—	—	(Arrange)	—	—	310 Ch.	Hecker

37. Experimental Problems in Physical and Electrochemistry.—Laboratory and conferences. I; (4). *Time to be arranged.*

Prerequisite: Chemistry 35 or 102b. Professor WASHBURN, Dr. MACINNES

61. Industrial Chemical Laboratory.—The preparation and purification of chemical products from raw materials on a scale sufficient to afford data for determining the economy of the processes employed. Typical forms of chemical machinery such as filter presses, vacuum pan, centrifugal separators, steam jacketed kettles, etc.; reports and estimates upon apparatus and plant for the production of some particular product on a commercial scale. (Should be accompanied by either Chemistry 6 or 109.) II; (3).

Prerequisite: Chemistry 5a and 14a-14b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	61	3	Lecture	—	—	—	11	—	—	111 Ch.	McFarland
			Laboratory	—	1-4	—	1-4	—	—	25 Ch.	McFarland

65. Technical Gas and Fuel Analysis.—Examination of gases, gas mixtures, flue gases and fuels; determination of calorific values; calculation of efficiencies. I; (2).

Prerequisite: Chemistry 5a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	65	2 A,	Lecture	1	—	—	—	—	—	111 Ch.	Broderson
			B, Lecture	—	1	—	—	—	—	111 Ch.	Broderson
			A, Laboratory	2,3	—	1-4	—	—	—	125 Ch.	Broderson
			B, Laboratory	—	2,3	—	1-4	—	—	125 Ch.	Broderson

66. Technology of Gases.—The manufacture, constituents, and uses of the various forms of gaseous fuel; calorimetry; photometry; the more exact methods of analysis. Lectures; reading; reports; laboratory. II; (1).

Prerequisite: Chemistry 65.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	66	1	—				(Arrange)		111 Ch.	Broderson

69. Metallurgical Laboratory and Assaying.—The fire assay of gold, silver, lead, and copper ores, mattes, and bullion; special experiments illustrating the underlying metallurgical principles; fluxes, slags, and charge calculations; practise in the use of coal, oil, and gas furnaces, and in the measurement of high temperatures. Fulton's *Manual of Fire Assaying*. I; (2).

Prerequisite: Chemistry 5a; Geology 5.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	69	2	Quiz	—	—	—	—	—	10	111 Ch. McFarland
		A, Laboratory	—	—	—	1-6	—	—		McFarland
		B, Laboratory	—	—	—	—	1-6	—		—

70. Advanced Assaying and Ore Testing.—The assay of ores of platinum, tin, copper; bullion assay; free milling, amalgamation, and cyaniding tests. (A continuation of Chemistry 69.) II; (2).

Prerequisite: Chemistry 69.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	70	2	—				(Arrange)		111 Ch.	McFarland

71. Advanced Methods of Metallurgical Analysis.—Comparison of methods for analyses of ores, alloys and metallurgical products. Laboratory. I; (2).

Prerequisite: Chemistry 5b.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	71	2	—				(Arrange)		111 Ch.	McFarland

72. Paints, Oils, Turpentine, Varnishes, and Protective Coverings for Wood and Metals.—Lectures and laboratory. I; (2).

Prerequisite: Chemistry 5a and 14a-14b.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	72	2	—				(Arrange)		111 Ch.	Parr

73. Asphalt, Tar, and Oil Residues.—Sources, characteristics, composition, and examination; binders, dust preventatives, etc., used in road construction. (For students in highway engineering.) II; (2).

Prerequisite: Chemistry 3 or 4.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	73	2	—				(Arrange)		107 Ch.	Parr

76. Calorimetry of Fuels.—Methods for determining the heat values of solid, liquid, and gaseous fuels. (An advanced course.) II; (2).

Prerequisite: Chemistry 65.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	76	2	—				(Arrange)		107 Ch.	Parr

Chemistry

77. Composition and Classification of Coal.—Classification, changes in composition, weathering, spontaneous combustion, formation of mine gases. Lectures; assigned reading. *II*; (1).

Prerequisite: Chemistry 65.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Chemistry	77	1	—							107 Ch.
(Arrange)										Instructor Parr

78. Metallography.—Constitution and microstructure of metals and alloys and the relations between their properties, chemical and mechanical treatment, and structure. Lectures; reading and laboratory. *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	78	2	Conference	—	—	9	—	—	—	111 Ch.	McFarland
			Laboratory	1-4	—	1-4	—	—	—	25 Ch.	McFarland

80. The Elements of Glass Blowing.—A laboratory course in the construction and repair of glass apparatus. *II*; (1). *Time to be arranged.*

Mr. ANDERS

86. The Chemistry of the Higher Order Compounds.—Complex compounds from the standpoint of the Valence Theory as developed by Werner. *I*; (2).

Prerequisite: Chemistry 9a, 9b, 14a-14b.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Chemistry	86	2	—							210 Ch.
(Arrange)										Instructor Smith

92a-92b, 93a-93b. Journal Meeting.—(For juniors, seniors, and graduates.) *I, II*; (1). *Time to be arranged.* All members of the teaching staff in the chemical department.

Assistant Professors MCFARLAND and DERICK in charge

95. History of Chemistry.—Lectures and assigned reading. *I*; (2).

Prerequisite: Chemistry 14a-14b and 31.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Chemistry	95	2	—	10	—	10	—	—	—	210 Ch.
										Instructor Smith

Courses for Graduates

Graduate students whose major subject is in some department other than chemistry, before taking graduate work for credit in this department, must have had the equivalent of 15 university credits in chemistry, and the work covered must have included satisfactory work in general chemistry and in qualitative and quantitative analysis. Such students are advised to take Chemistry 31, 33, (or 102, 102a), 5b, 5c, 14a-14b, 9a and 9b. Courses of a more special nature will not, as a rule, be accepted for graduate work unless preceded by one of the above courses.

For students in agriculture, Chemistry 5a and 13a will not be accepted for graduate credit.

Graduate students who are candidates for an advanced degree in chemistry must have had the equivalent of 30 university credits in chemistry, properly distributed.

For students in chemistry, 5a, 13a, 9, and 9c will not be accepted for graduate credit and 9a, 9b, 14a-14b, 31 and 33 will be accepted only from students entering the Graduate School with the equivalent of 30 university credits in chemistry.

[102. Advanced Physical Chemistry.]—This course with 102a, covers a period of two years. The subject is treated from the standpoint of molecular kinetics and thermodynamics. The primary purpose is to develop power to handle successfully a physico-chemical problem rather than merely to impart a knowledge of the phenomena and the principles involved. Lectures and seminar. Nernst's *Theoretische Chemie*, 7th edition. *Twice a week; I, II; ($\frac{3}{4}$ unit).* Not given in 1915-1916.

Prerequisite: Chemistry 1, 2; Physics 1a-1b, 3a-3b; Mathematicse 8a or 7 and 9. An elementary knowledge of organic and physical chemistry is desirable.]

102a. Advanced Physical Chemistry.—Chemical equilibrium; the Phase Rule; certain portions of thermochemistry; photochemistry. (A continuation of 102, with which it alternates.) Nernst's *Theoretische Chemie*. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

Prerequisite: The same as course 102.

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102a $\frac{3}{4}$ unit	—	—	8	—	8	—	—	114 Ch.	Washburn

102b. Advanced Electrochemistry.—The modern theories of solution and the principles of thermodynamics in their application to the problems of electrochemistry; electro-motive force and the energy principles underlying the transformation of chemical and electrical energy. *Two times a week; II; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 102; Mathematics 8a or 7 and 9.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102b $\frac{3}{4}$ unit	—	—	—	8	—	8	—	114 Ch.	MacInnes

102c. Advanced Physical and Electrochemistry.—The applications of physico-chemical methods to special problems. Laboratory. *Twice a week; I; ($\frac{1}{2}$ to 1 unit).*

Prerequisite: Chemistry 31, 33; registration in Chemistry 102b, or completion of Chemistry 102, 102a, or 102b; Mathematics 8a or 7 and 9.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102c $\frac{1}{2}$ to 1 unit	—	(Arrange)						114 Ch.	Washburn

102d. Electrochemistry.—Theoretical and applied electrochemistry, with emphasis on the technical side of the subject. (For students in electrical engineering.) *Once a week; I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102d $\frac{1}{2}$ unit	—	(Arrange)						114 Ch.	MacInnes

102e. Special Topics in Physical Chemistry.—Subject for 1915-16: Radiochemistry. Soddy, *The Chemistry of the Radio Elements*. *Once a week; I; ($\frac{1}{2}$ unit).*

Prerequisite: Chemistry 102 or 102a.

Chemistry

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102e ½ unit	—					(Arrange)		114 Ch.	Washburn

103. Advanced Inorganic Chemistry.—Descriptive inorganic chemistry; the rarer elements; the periodic system. Lectures, with or without laboratory. *Two to five times a week; I, II; (½ to 1¼ units).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103a ½ to 1¼ units	—					(Arrange)		321 Ch.	Balke

103a. Advanced Analytical Chemistry.—Special topics. Lectures, with or without laboratory. *One to five times a week; II; (½ to 1¼ units).*

Prerequisite: Chemistry 5b, 9a, 9b, 14a-14b, 31, 33.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103a ½ to 1¼ units	—	—	—	11	—	11	—	210 Ch.	Smith

103b. Special Topics in Inorganic Chemistry.—Subject for 1915-16: The Chemistry of the Higher Order Compounds. Werner, *Neuere Anschauungen auf dem Gebiete der Inorganischen Chemie*; assigned reading from later publications. Lectures and seminar. *Twice a week; I; (¾ unit).*

Prerequisite: Chemistry 9a, 9b, 14a-14b.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103b ¾ unit	—	—	10	—	10	—	—	210 Ch.	Smith

103c. Special Topics in Inorganic Chemistry.—Seminar. Subject for 1915-16: The Determination of Atomic Weights. *Twice a week; II; (¾ unit).*

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103c ¾ unit	—					(Arrange)		321 Ch.	Balke

103d. Advanced Qualitative Analysis.—Methods of separation; qualitative reagents; reactions of some of the less common elements. Designed especially for those intending to teach qualitative chemistry. Lectures, with or without laboratory. *One to three times a week; I; (½ to 1 unit).*

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103d ½ to 1 unit	—					(Arrange)		319 Ch.	Weber

[104. Advanced Organic Chemistry.—Seminar. The open chain compounds of carbon, hydrogen, and oxygen atoms from the standpoint of the atomic linking theory; tautomerism, stereochemistry; and the carbohydrates. Lectures; discussions; laboratory. *Three times a week; I, II; (¾ unit).* Not given in 1915-16].

104a. Advanced Organic Chemistry.—(Continuation of 104, with which it alternates). The closed chain compounds of the carbon, hydrogen, and oxygen atoms and of the organic compounds of nitrogen; the ureids, alkaloids. Lectures; discussion, laboratory. *Three times a week; I, II; (¾ unit).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104a ¾ unit	—	—	11	—	11	1-5	—		Derick

104b. Advanced Quantitative Organic Analysis.—Proteins, alkaloids, glucosides, volatile oils, and other constituents of animal and vegetable tissues. Plant analysis. Toxicological analysis. The general methods, chemical and physical, of organic analysis. Lectures and seminar. May be accompanied by laboratory work on a selected group of compounds. *Twice a week; I, II; (¾ unit).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104b ¾ unit	—				(Arrange)			208 Ch.	Beal

104c. Special Topics in Organic Chemistry.—Seminar. *Once a week; II; (¼ unit).*

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104c ¼ unit	—				(Arrange)			213 Ch.	Derick

105. Chemistry of Plants.—Carbohydrates, glucosides, fats, lipines, proteins, inorganic salts, alkaloids, tannins, pigments, enzymes, oxygen, and carbon dioxide. Plant processes and their physiological significance. Conferences and discussions. *II; (¾ or 1¼ units).*

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105 ¾ or 1¼ units	—				(Arrange)			217 Ch.	Lewis

105a. Advanced Physiological Chemistry.—Special investigations. Laboratory. *One to five times a week; I or II; (¾ unit).*

EITHER SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105a ¾ unit	—				(Arrange)			225 Ch.	Lewis

105b. Advanced Physiological Chemistry.—The biological importance of diffusion, solutions, chemical equilibrium, adsorption, colloids, osmosis, permeability, and enzymes. Recent contributions are emphasized. *Two times a week; I or II; (¾ unit).*

EITHER SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105b ¾ unit	—				(Arrange)			225 Ch.	Lewis

106. Animal Chemistry (Animal Nutrition.)—The recent advances in the chemistry of nutrition of the lower animals; the chemistry of the functional products; the flesh, fat, milk, and wool of the more common domesticated animals. Lectures; conferences; assigned reading; laboratory. *Five times a week; I, II; (1 to 1½ units).*

Prerequisite: Two years' work in chemistry.

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	106 1 to 1½ units	—				(Arrange)			558 Ag.	Grindley

Chemistry

107. Special Problems in Technology of Fuels.—I; (1 unit).

Prerequisite: Chemistry 77.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	107 1 unit	—					(Arrange)		107 Ch.	Parr

107a. Gas Manufacture.—Carbonization processes, ovens and by-products. *Once a week; II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	107a $\frac{1}{2}$ unit	—					(Arrange)		107 Ch.	Parr

108. Advanced Metallography.—Constitution and microstructure of metals and alloys; the relations between their properties, chemical and mechanical treatment, and structure. Assigned reading and laboratory. *Twice a week; I; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 7 and 78 or equivalent.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	108 $\frac{3}{4}$ unit	—					(Arrange)		111 Ch.	McFarland

109. Advanced Industrial Chemistry.—Seminar. Some of the more important chemical industries; the development and chemical control of processes. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 6, 9, 14a-14b, 21 or equivalent.

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	109 $\frac{3}{4}$ unit	—	8	—	8	—	—	—	111 Ch.	McFarland

110. Water Supplies.—The sources of contamination of water supplies and the purification of water for potable or technical use. *One to five times a week; I, II; ($\frac{1}{2}$ to $1\frac{1}{4}$ units).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	110 $\frac{1}{2}$ to $1\frac{1}{4}$ units	—					(Arrange)		116 Ch.	Bartow

111. Research.—A thesis is usually required of students taking the Master's degree and is always required of students taking the degree of Doctor of Philosophy. (For a description of undergraduate work leading to a thesis, see Chemistry 11.) Work may be taken in the following subjects:

PHYSICAL AND ELECTROCHEMISTRY Professor WASHBURN, Dr. MACINNES
INORGANIC CHEMISTRY

Professor BALKE, Assistant Professors SMITH, WEBER

ANALYTICAL CHEMISTRY Assistant Professor SMITH

FOOD CHEMISTRY Dr. BEAL

ORGANIC CHEMISTRY Professor NOYES, Assistant Professor DERICK

WATER CHEMISTRY Professor BARTOW

ANIMAL CHEMISTRY (Animal Nutrition) Professor GRINDLEY

PHYSIOLOGICAL CHEMISTRY Dr. LEWIS

INDUSTRIAL CHEMISTRY Professor PARR, Assistant Professor MCFARLAND

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	111	—	—							106 Ch.	Noyes and others

CIVIL ENGINEERING

FREDERICK HAYNES NEWELL, B.S., D.Eng., *Professor*
 IRA OSBORN BAKER, B.S., C.E., D.Eng., *Professor*
 CHARLES ALTON ELLIS, A.B., *Professor*
 ALLEN BOYER McDANIEL, B.S., *Assistant Professor*
 JAMES ELMO SMITH, B.S., C.E., *Assistant Professor*
 WILBUR M. WILSON, M.M.E., C.E., *Assistant Professor*
 CARROLL CARSON WILEY, B.S., C.E., *Associate*
 NEAL BRYANT GARVER, B.S., C.E., *Associate*
 GEORGE WELLINGTON PICKELS, JR., B.C.E., C.E., *Instructor*
 WILLIAM HORACE RAYNER, B.S., C.E., *Instructor*
 RAYMOND EARL DAVIS, B.S., C.E., *Instructor*
 C STANLEY SALE, B.S., *Instructor*
 BENJAMIN LESTER BOWLING, *Assistant in Cement Laboratory*

27. Plane Surveying.—The theory, use, and adjustment of the compass, transit, and level; the computation of areas and the partitioning of land; the U. S. land survey methods, the re-establishment of corners and boundaries, and the interpretation of deeds; farm and city surveying. Problems with the tape, compass, transit, and level. Breed and Hosmer's *Principles and Practice of Surveying*, Vol. I. Davis's *Manual of Surveying*. I; (3).

Prerequisite: General Engineering Drawing 1, 2; Mathematics 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	27	3	E	8	—	8-11	—	8-11	—	101,102 E. H.	Davis Rayner
			F	9	1-4	—	1-4	—	—	101,102 E. H.	
			G	1-4	—	1	—	1-4	—	101,102 E. H.	

28. Higher Surveying.—The theory and use of the transit and plane-table in making topographic surveys; methods; the determination of latitude, longitude, and azimuth by stellar and solar observations; topographic drawing; a complete topographic survey based on a system of triangulation. Breed and Hosmer's *Principles and Practice of Surveying*, Vol. II. Davis's *Manual of Surveying*. II; (3).

Prerequisite: Civil Engineering 27; Physics 1a, 3a, and registration in Physics 1b, 3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	28	3	E	8	—	8-11	—	8-11	—	101,109 E. H.	Davis Pickels Rayner
			F	10	1-4	—	1-4	—	—	101,109 E. H.	
			G	1-4	—	1	—	1-4	—	102,105 E. H.	

31. Surveying.—(For students in Landscape Architecture). The theory, use, and adjustment of the compass, level, transit, and plane-table. The determination of distances by pacing, and with chain and tape, and of areas with

Civil Engineering

compass and transit; profile leveling; problems with plane-table. Raymond's *Plane Surveying. I*; (3).

Prerequisite: Mathematics 4; Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	31	3	—	—	8-11	8	8-11	—	—	109 E. H.	Pickels

32. Topographic Surveying.—(For students in Landscape Architecture). The theory and use of the stadia; conventional topographical signs; contour construction; its use in grading and drainage problems; advanced work with the plane-table. Each student will prepare a large scale topographic map of a portion of the campus. Raymond's *Plane Surveying. II*; (3).

Prerequisite: Civil Engineering 31.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	32	3	—	—	8-11	8	8-11	—	—	102,105 E. H.	Pickels

33. Surveying.—(For students in Geology). The use and adjustment of the compass, level, transit, and plane-table. The determination of distances by pacing, and with chain and tape; the determination of areas with the compass, and transit; differential leveling; a survey for a large scale map with plane-table. The U. S. land survey methods; problems in strike and dip. Breed and Hosmer's *Principles and Practice of Surveying*, Vol. I. Davis's *Manual of Surveying. I*; (3).

Prerequisite: Mathematics 4; General Engineering Drawing 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	33	3	—	1-4	—	1	—	1-4	—	101 E. H.	Rayner

34. Topographic Surveying.—(For students in Geology). The theory and use of stadia measurements; azimuth determinations from solar and stellar observations; lettering, conventional topographic signs; contour construction; its relation to geologic formations; survey for small scale map with plane-table, barometer, and pacing methods. Breed and Hosmer's *Principles and Practice of Surveying*, Vol. II. Davis's *Manual of Surveying. II*; (3).

Prerequisite: Civil Engineering 33, and junior standing in Geology.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	34	3	—	1-4	—	1	—	1-4	—	101,105 E. H.	Rayner

51. Railroad Surveying.—Economic location, construction, and maintenance of railways. Curves, turnouts, and earthwork. Preliminary and location surveys of a line of sufficient length to secure familiarity with the methods in actual practise. Each student makes a complete set of maps, profiles, and estimates. Pickels' and Wiley's *Railroad Surveying. I*; (5).

Prerequisite: Civil Engineering 27, 28.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	51	5	E	9-11	9-12	9-12	—	9-12	—	105 E. H.	Pickels
			F	9-12	—	9-11	9-11	9-12	—	211 E. H.	
			G	1-3	1-4	—	1-3	1-4	—	105 E. H.	Wiley
			H	1-4	1-3	1-4	—	1-3	—	109 E. H.	

52. Roads and Pavements.—Construction and maintenance of earth, gravel, macadam, concrete, and bituminous roads. Construction and maintenance of street pavements, and their adaptation to country roads. Road-building machinery. Effect of travel on road surfaces. Dust prevention and street cleaning. *Baker's Roads and Pavements. II; (3).*

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2; Civil Engineering 27, 28, 51.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	52	3	E	10	—	10	—	10	—	219 E. H.	Smith Wiley
			F	1	—	1	—	1	—	205 E. H.	
			G	9	—	9	—	9	—	219 E. H.	

53. Railroad Surveying.—First eleven weeks of Civil Engineering 51, for municipal and sanitary engineering juniors. *I; (3).*

Prerequisite: Civil Engineering 27, 28.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	53	3	H	1-4	1-3	1-4	—	1-3	—	109 E. H.	Pickels

55. Roads and Pavements.—(For Landscape Gardeners). *Baker's Roads and Pavements. I; (2).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	55	2	—	—	—	9	—	9	—	205 E. H.	Garver

58. Graphic Statics.—(For Mining Engineers). Determination of stresses in roof and bridge trusses and in three-hinged arches. *Malcolm's Elements of Graphic Statics. II; (2).*

Prerequisite: Theoretical and Applied Mechanics 20, 25.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	58	2	—	—	—	2-4	—	2-4	—	211 E. H.	Smith

60. Structural Stresses.—The determination of stresses in roofs, bridges, and steel-skeleton buildings, by algebraic and graphic processes. *Marrburg's Frame Structures and Girders, Vol. I. II; (3).*

Prerequisite: Mathematics 2, 4, 6; Theoretical and Applied Mechanics 20, 21, 29, 10; General Engineering Drawing 1, 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	60	3	E	11	—	11	9-12	11	—	205, 214 E. H.	Ellis Wilson
				—	8	—	—	—	—	221 E. H.	
			F	8	9-12	8	—	8	—	205, 211 E. H.	
				8	8	10	—	10	—	221 E. H.	
			G	10	1-4					205, 221 E. H.	
										211 E. H.	

62. Structural Details.—Design of details for roofs, bridges, and steel-frame buildings; detail drawings and shop bills. *II; (3).* *Carnegie's Pocket Companion*, last edition.

Prerequisite: Registration in Civil Engineering 60.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	62	3	E	—	—	1-5	—	—	—	211 E. H.	Garver
			F	—	—	—	8-12	—	—	211 E. H.	
			G	—	—	—	—	1-5	—	211 E. H.	

Civil Engineering

70. Seminar.—Reading and discussion of papers. Each student presents one major and two minor papers upon assigned topics, and participates in the discussion of other papers. *II*; (1).

Prerequisite: Full junior standing in Civil Engineering.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	70	1	E	—	—	—	1-3	—	219 E. H.	Baker Davis
			F	—	—	2-4	—	—	219 E. H.	
			G	1-3	—	—	—	—	109 E. H.	

76. Surveying.—U. S. public land surveys; principles of re-establishing corners. Use of transit in finding distances, areas, and in laying out buildings; use of the level in finding profiles and contours. Davis's *Manual of Surveying*. *II*; (2).

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2; Physics 1a-1b, 3a-3b.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	76	2	—	—	9-11	—	9-11	—	102 E. H.	Pickels
			—	—	1-3	—	1-3	—	102 E. H.	

77. Masonry Construction.—Baker's *Masonry Construction*. *I*; (4).

Prerequisite: Theoretical and Applied Mechanics 20, 21, 29, 10; Civil Engineering 60.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	77	4	E	11	11	—	11	11	219 E. H.	Baker McDaniel
			F	9	9	—	9	9	219 E. H.	
			G	8	8	—	8	8	219 E. H.	

79. Cement Laboratory Practise.—Standard tests for hydraulic cement. *I*; (1).

Prerequisite: Theoretical and Applied Mechanics 20, 21, 29, 10; Civil Engineering 60; registration in Civil Engineering 77.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	79	1	E	1-3	—	—	—	—	Cem. Lab.	Baker McDaniel Bowling
			F	—	1-3	—	—	—	Cem. Lab.	
			G	—	—	—	10-12	—	Cem. Lab.	
			H	—	—	—	1-3	—	Cem. Lab.	

80. Engineering Contracts and Specifications.—The law of contracts; general and technical clauses used in engineering specifications. Johnson's *Engineering Contracts and Specifications*. *II*; (2).

Prerequisite: Full senior standing in an engineering course.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	80	2	E	—	10	—	10	—	205 E. H.	Baker McDaniel
			F	11	—	11	—	—	219 E. H.	
			G	—	8	—	8	—	205 E. H.	
			H	—	11	—	11	—	205 E. H.	

81. Theory of Reinforced Concrete.—Reinforced concrete beams, columns, slabs, etc. Hool's *Reinforced Concrete Construction*. *I*; (1).

Prerequisite: Registration in Civil Engineering 77, 79, and 83, or 85.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	81	1	E	9	—	9	—	—	—	205 E. H.	Ellis McDaniel
			F	—	11	—	11	—	—	205 E. H.	
			G	11	—	11	—	—	—	205 E. H.	

82. Reinforced Concrete Design.—Plain and reinforced concrete arches, culverts, dams, bridges, and retaining walls. Hool's *Reinforced Concrete Construction*, Vol. II. II; (4).

Prerequisite: Civil Engineering 81.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	82	4	F	1-4	—	1-4	—	1-4	—	214 E. H.	McDaniel

83. Bridge Design.—(For Railway Civil Engineers, and Civil Engineers taking the General Civil Engineering Option). Determination of stresses and sections of a plate girder and a truss span; stress sheet, general design drawings, and estimate of weights. I; (3).

Prerequisite: Civil Engineering 60, 62.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	83	3	E	—	1-4	—	1-4	—	—	214 E. H.	Wilson

85. Steel Bridge Design.—(For Civil Engineers taking the Structural Engineering Option). Same as 83 above, but a fuller course. I; (5).

Prerequisite: Civil Engineering 60, 62.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	85	5	F	1-4	—	1-4	—	1-4	—	211 E. H.	Wilson

87. Advanced Bridge Analysis.—Continuous, draw, cantilever, suspension, and metal-arch bridges. Johnson, Bryan and Turneure's *Modern Framed Structures*. Part II. I; (2).

Prerequisite: Civil Engineering 60, 62; and registration in Civil Engineering 83 or 85.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	87	2	E	—	9	—	9	—	—	205 E. H.	Ellis
			F	—	10	—	10	—	—	205 E. H.	
			G	—	9	—	9	—	—	205 E. H.	

88. Steel Building Design.—Stresses and sections of the steel frame of mill and office buildings; footings and grillages; design drawings and estimate of weights. II; (3).

Prerequisite: Civil Engineering 60, 62.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	88	3	F	—	1-4	—	1-4	—	—	214 E. H.	Wilson

91. Highway Bridge Design.—Types of highway bridges; determination of location, size, and type. Steel bridges, beam, low-truss, and through-truss; methods and cost of construction. I; (4).

Prerequisite: Civil Engineering 60, 62.

Civil Engineering

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	91	4	G	—	1-4	—	1-4	—	—	211 E. H.	Garver

92. Concrete Bridges and Culverts.—Reinforced-concrete slab, girder, and arch bridges; falsework and forms; estimates of quantities; costs. *II*; (2).

Prerequisite: Civil Engineering 77, 79, 81, 91.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	92	2	G	—	1-4	—	1-4	—	—	211 E. H.	Garver

93. Road Construction.—Merits of different types of roads and pavements; principles of design; preparation of plans, specifications, and estimates of cost. *I*; (3).

Prerequisite: Civil Engineering 52, Theoretical and Applied Mechanics 21, 29.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	93	3	E	—	8	—	8	—	8-11	102 E. H.	Wiley
			G	—	11	1-4	11	—	—	102 E. H.	
										214 E. H.	

94. Highway Administration.—Road construction and maintenance in Europe and America; taxation and methods of financing road work; the relation of highway improvement to social and economic welfare. *II*; (3).

Prerequisite: Senior standing in Civil Engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	94	3	G	8	—	8	—	8	—	219 E. H.	Wiley

96. Road Laboratory.—Examining and testing bituminous and non-bituminous road materials; interpretation of the results. *II*; (2).

Prerequisite: C. E. 52, 77, 79; registration in Chemistry 73.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	96	2	E	—	—	—	—	10-12	9-12	—	Wiley
			G	1-3	—	—	—	1-4	—	122 E. H.	

97-98. Thesis.—A problem in investigation or design, subject to the approval of the head of the department. Only students of high standing are permitted to take a thesis. *I*; (1); *II*; (2). (*Time to be arranged*).

Prerequisite: Full senior standing in Civil Engineering.

THE CLASSICS

HERBERT JEWETT BARTON, A.M., *Professor, Chairman*

CHARLES MELVILLE MOSS, Ph.D., *Professor*

WILLIAM ABBOTT OLDFATHER, Ph.D., *Professor*

ARTHUR STANLEY PEASE, Ph.D., *Professor*

HOWARD VERNON CANTER, Ph.D., *Assistant Professor*

GREEK

Major: 20 hours, excluding Greek 1a-1b, 17, 18, and 19.

Minors: 20 hours chosen from foreign languages (Latin being especially recommended), English literature, history, and philosophy.

LATIN

Major: 20 hours, excluding Latin 1a, 6a, and 12.

Minors: 20 hours chosen from foreign languages (Greek being especially recommended), English literature, history, and philosophy.

CLASSICS

Major: 20 hours in Greek and Latin, excluding Greek 1a-1b, 16, 17, 18, 19, and 20, and Latin 1a, 6a, 12, 13, and 19. At least six hours shall be carried in the secondary language and the remaining hours in the primary language.

Minors: 20 hours chosen from foreign languages, English literature, history, and philosophy.

GREEK

Courses for Undergraduates

The courses in translation naturally follow each other in the following sequence: 1a-1b, 3, 7 (5), 6 (8). Courses 1a-1b, 3, and 4 are intended for students who cannot present Greek for entrance to the University, but who desire to commence the study of the language. Course 2a-2b, may be taken after course 1a-1b and course 14 after courses 5 or 7. Courses 16, 17, 18, and 19 are open to sophomores, juniors, and seniors; 20 is open to those who have completed one year in history or classics.

1a-1b. Grammar and Reader.—a (first semester), Attic forms: reading of simple prose; b (second semester), Xenophon's *Anabasis*. Book 1. *I, II*; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	1a	4	—	—	11	11	11	11	—	114 L. H.	Oldfather

SECOND SEMESTER

Greek 1b 4 Schedule the same as for 1a (first semester).

2a-2b. New Testament Greek.—a (first semester), Reading of selections; b (second semester), Lectures on Canon and Text. *I, II*; (2).

Prerequisite: Greek 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	2a	2	—	—	10	—	10	—	—	114 L. H.	Moss

SECOND SEMESTER

Greek 2b 2 Schedule the same as for 2a (first semester).

3. Second Year Greek.—Xenophon's *Anabasis*, Books II-IV; Grammatical drill. *I*; (3).

Prerequisite: Greek 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	3	3	—	2	—	2	—	2	—	120 L. H.	Canter

The Classics

4. Second Year Greek.—Homer, six Books of the *Iliad*. II; (3).

Prerequisite: Greek 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	4	3	—	2	—	2	—	2	—	120 L. H.	Canter

6. Thucydides.—*The Sicilian Expedition*, Books VI-VII. I; (3).

Prerequisite: Greek 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	6	3	—	9	—	9	—	9	—	124 L. H.	Pease

7. Greek Drama.—Three plays from the great dramatists. II; (3).

Prerequisite: Greek 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	7	3	—	9	—	9	—	9	—	114 L. H.	Moss

14. Greek Prose Composition.—II; (1).

Prerequisite: Greek 5 and 6 or 7 and 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	14	1	—	—	—	—	—	11	—	124 L. H.	Moss

Greek Life and Literature in English

(Courses 16-20 presuppose no knowledge of Greek and are open to all students except freshmen).

16. **The Private and Public Life of the Greeks.**—Lectures illustrated by photographs and slides; prescribed readings; I; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	16	1	—	—	—	—	3	—	—	120 L. H.	Moss

17. Greek Poetry in Translations.—I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	17	2	—	—	11	—	11	—	—	124 L. H.	Moss

18. Greek Prose in Translations.—I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	18	2	—	11	—	11	—	—	—	120 L. H.	Moss

19. Greek Drama in Translations.—II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	19	2	—	—	11	—	11	—	—	124 L. H.	Moss

20. **Greek History.**—(This course is described by the department of history as History 5). I; (3).

Prerequisite: One course in history or the classics. Not open to freshmen.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	20	3	—	3	—	3	—	3	—	120 L. H.	Oldfather

Courses for Graduates

105. Plato and Aristotle.—Selections from the political and ethical writings. *I, II; (1 unit). Time to be arranged.* Professor **OLDFATHER**

107. Greek Oratory.—One or more speeches of each of several orators; lectures and reports. *I, II; (1 unit).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	107	1 unit	—	—	8	—	8	—	—	114 L. H.	Moss

110. Bibliography and Criticism.—*Once a week; I, II; (1/4 unit).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	110	¼ unit	—	2	—	—	—	—	—	104 L. H.	Oldfather Pease and others

LATIN

1a-1b. Ovid and Virgil.—a (first semester), selections from the *Amores*, *Heroides*, and *Metamorphoses*; b (second semester), selections from the *Aeneid*. *I, II; (4).*

Prerequisite: Three entrance units in Latin.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	1a	4	—	—	8	8	8	8	—	120 L. H.	} Canter Pease

SECOND SEMESTER

Latin 1b 4 Schedule the same as for 1a (first semester).

2a-2b. Livy, Plautus and Terence.—a (first semester), selections from Livy, the story of Hannibal; b (second semester), the *Rudens* of Plautus and the *Phormio* of Terence. *I, II; (4).*

Prerequisite: Four entrance units in Latin.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	2a	4	—	—	9	9	9	9	—	120 L. H.	Barton

SECOND SEMESTER

Latin 2b 4 Schedule the same as for 2a (first semester).

3. Sallust and Cicero.—Selections from the *Jugurthine War*; *De Senectute*. *I; (3).*

Prerequisite: Latin 2a-2b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	3	3	—	9	—	9	—	9	—	114 L. H.	Canter

The Classics

4. Horace and Catullus.—Selections. *II*; (3).

Prerequisite: Latin 2a-2b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	4	3	—	10	—	10	—	10	—	120 L. H.	Barton

5a-5b. Latin Composition.—Grammatical drill and practise in the simpler forms of expression. *I, II*; (1).

Prerequisite: Latin 1a-1b or its equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	5a	1	—	8	—	—	—	—	—	120 L. H.	Pease Canter

SECOND SEMESTER										
Latin	5b	1	Schedule the same as for 5a (first semester).							

6. Cicero.—Selections from the *Orations*. *I*; (4).

Prerequisite: Two entrance units in Latin.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	6	4	—	—	10	10	10	10	—	120 L. H.	Canter

Roman Life and Literature in English

(Courses 12 and 13 presuppose no knowledge of Latin; open to all students except freshmen).

12. Virgil and Horace in English Translations.—The *Aeneid* and selections from Horace. *I*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	12	2	—	—	3	—	3	—	—	114 L. H.	Barton

13. Roman Life.—The family, organization of society, education, marriage, amusements, with some attention to the monuments. Lectures and assigned readings illustrated by photographs and slides. *II*; (1).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	13	1	—	—	—	—	3	—	—	202 L. H.	Barton

19. Roman History.—(This course is described by the department of history as History 6). Not open to freshmen. *II*; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	19	3	—	3	—	3	—	3	—	120 L. H.	Canter

9. Teachers' Course.—The purpose and methods of preparatory Latin instruction; the teacher's preparation. *II*; (2).

Prerequisite: 18 hours in Latin. A portion of this requirement may be waived in the case of those who have taught Latin.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	9	2	—	—	11	—	11	—	—	120 L. H.	Barton

10. Latin Composition.—The leading principles; imitation of assigned models. *I; (2).*

Prerequisite: 12 hours in Latin, including Latin 5a-5b or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	10	2	—	—	11	—	11	—	—	120 L. H.	Barton

Courses for Advanced Undergraduates and Graduates

8. Tacitus.—The *Annals*, Books I-VI. *I; (3).*

Prerequisite: 12 hours in Latin.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	7	3	—	10	—	10	—	10	—	114 L. H.	Pease

16. Martial and Suetonius.—Selections; lectures on literary history. *II; (3).*

Prerequisite: 18 hours in Latin.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	16	3	—	10	—	10	—	10	—	114 L. H.	Oldfather

22. Late Latin.—Rapid reading of selections from the Latin writers from Minucius Felix to Cassiodorus. *II; (2).*

Prerequisite: This course is open to seniors and graduates who have had two years of college Latin or who otherwise satisfy the instructor of their ability to do the work required.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	22	2	—	—	2	—	2	—	—	114 L. H.	Pease

Courses for Graduates

Students desiring to take graduate work in Latin should have had at least three years of college Latin in addition to the Latin presented to meet entrance requirements.

102. Roman Oratory.—*Twice a week. II; (½ unit). Time to be arranged.*
Assistant Professor CANTER

103. Cicero.—*De Natura Deorum* and *De Divinatione. Twice a week; I; (½ unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	103	½ unit	—	—	9	—	9	—	—	114 L. H.	Pease

104. Latin Paleography.—*Twice a week. I; (½ unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	104	½ unit	—	—	10	—	10	—	—	104 L. H.	Pease

Comparative Literature

106. **Terence.**—*Twice a week. I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	106 $\frac{1}{2}$ unit	—	—	—	2	—	2	—	114 L. H.	Oldfather

107. **Latin Epigraphy.**—*Twice a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	107 $\frac{1}{2}$ unit	—	—	9	—	9	—	—	104 L. H.	Pease

108. **Tacitus.**—*The Histories. Twice a week. I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	108 $\frac{1}{2}$ unit	—	—	2	—	2	—	—	114 L. H.	Barton

109. **Virgil.**—*Twice a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	109 $\frac{1}{2}$ unit	—	9	—	9	—	—	—	124 L. H.	Pease

110. **Proseminar.**—*Once a week. I, II; ($\frac{1}{4}$ unit).*

BOTH SEMESTERS										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Latin	110 $\frac{1}{4}$ unit	—	2	—	—	—	—	—	104 L. H.	Oldfather Pease and others

114. **Caesar.**—*Twice a week. II; ($\frac{1}{2}$ unit). Time to be arranged.*

Professor OLDFATHER

COMMERCIAL LAW

(See BUSINESS ORGANIZATION AND OPERATION.)

COMPARATIVE LITERATURE

JOSEPH C GILLET, Ph.D., *Associate in Comparative Literature and German*

1. **Tragedy.**—Theory and practise from classical times to the present day. Lectures; readings; reports. *I; (3).*

Prerequisite: Two years of college work, or the permission of the instructor. Foreign language is not required.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Comparative Literature	1 3	—	9	—	9	—	9	—	205 L. H.	Gillet

2. **Comedy.**—Theory and practise from classical times to the present day. Lectures; readings; reports. *II; (3).*

Prerequisite: Two years of college work, or the permission of the instructor. Foreign language is not required.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Comparative Literature	2 3	—	9	—	9	—	9	—	205 L. H.	Gillet

COMPARATIVE PHILOLOGY

LEONARD BLOOMFIELD, Ph.D., *Assistant Professor*

For Graduates and Advanced Undergraduates

1. **Introduction to the Study of Languages.**—Phonetics; the development of forms of speech; dialects and the spread of languages; the study and teaching of language. *I*; (3).

Prerequisite: The consent of the instructor.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Comparative Philology	1	3	—	9	—	9	—	9	—	215 L. H.	Bloomfield

2. **Comparative Philology of the Indo-European Languages.**—Attention will be given chiefly to Greek, Latin, and the Germanic languages, including English. *II*; (2).

Prerequisite: The consent of the instructor.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Comparative Philology	2	2	—	—	9	—	9	—	—	215 L. H.	Bloomfield

3. **Elementary Sanskrit.**—Reading and grammar. *I*; (3).

Prerequisite: The consent of the instructor.

				FIRST SEMESTER								
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>	
Comparative Philology	3	3	—	10	—	10	—	10	—	205 L. H.	Bloomfield	

4. **Elementary Sanskrit.**—Continuation of 3. *II*; (3).

Prerequisite: Comparative Philology 3.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Comparative Philology	4	3	—	10	—	10	—	10	—	205 L. H.	Bloomfield

DAIRY HUSBANDRY

HARRY ALEXIS HARDING, Ph.D., *Professor, Dairy Bacteriology*

*WILBUR JOHN FRASER, M.S., *Professor, Dairy Farming*

MARTIN JOHN PRUCHA, Ph.D., *Assistant Professor, Dairy Bacteriology*

NELSON WILLIAM HEPBURN, M.S., *Assistant Professor, Dairy Manufactures*

EDWARD FREDERICK KOHMANN, Ph.D., *Associate, Dairy Chemistry*

LEROY LANG, M.S., *Associate, Dairy Manufactures*

WILLIAM TRUMAN CRANDALL, M.S., *Associate, Milk Production*

HARRISON AUGUST RUEHE, B.S., *Associate, Dairy Manufactures*

*On leave of absence.

Dairy Husbandry

RAY STILLMAN HULCE, M.S., *Associate, Milk Production*
 WILLIAM WODIN YAPP, M.S., *Instructor, Dairy Husbandry*
 WILLIAM BARBOUR NEVENS, B.S., *Assistant, Dairy Husbandry*
 PAUL WILLIAM ALLEN, M.S., *Assistant, Dairy Bacteriology*
 LEIGHTON J. TRUE, B.S., *Assistant, Dairy Manufactures*

1. Milk Testing.—The Babcock test; official testing; inspectors' methods; tests for purity and adulteration; lactometer; acid tests; tests for preservatives; butter analysis; moisture, salt and fat tests. Lectures; assigned readings; laboratory practise. (Alternates with Dairy Husbandry 16 in first semester if desired.) *I or II; (3).*

EITHER SEMESTER												
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Dairy Husbandry	1	3	A, Laboratory	—	10,11	—	11	—	10,11	—	Hepburn Kohmann	
			A, Lecture	—	—	—	10	—	—	—		
			Quiz	}								
			B, Laboratory		—	1,2	—	2	—	8,9		—
			B, Lecture		—	—	—	1	—	—		—
			Quiz	}								

2. Dairy Cattle.—The relation of dairy type to milk and butter fat production; origin and history of breeds; their characteristics, type, and adaptability to markets and climatic conditions; prominent families and individuals in principal breeds; herd improvement; selection of animals on performance, breeding, and physical conformation; grading up by use of superior sires. Lectures; recitations; judging. *II; (4).*

Prerequisite: Dairy Husbandry 3, Animal Husbandry 5.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	2	4	Lecture	9	—	9	—	—	—	701 Ag.	Crandall
Husbandry			Laboratory	—	8,9	—	8,9	—	—	S. P.	Crandall

3. Elements of Dairy Husbandry.—The dairy herd; dairy sanitation; milk testing; milk; milk products. Required of all freshmen in the general course in Agriculture. Lectures; demonstrations. *I or II; (1).*

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	3	1	A	—	10,11	—	—	—	—	701 Ag.	Hulce
Husbandry			B	—	1,2	—	—	—	—	701 Ag.	and others

4. Ice Cream Making.—Ice cream making; types of freezers; methods of freezing; mixing and freezing ice cream, sherbets and other frozen products; plans for ice cream factories; flavoring extracts, fillers, and binders; ice cream standards; the study and making of condensed milk; its relation to the ice cream industry; use of refrigerating machinery in the ice cream plant. This course is accompanied by one inspection trip, costing from \$10 to \$15. *I or II; (3).*

Prerequisite: Dairy Husbandry 1.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	4	3	—	—	10,11	—	10,11	—	10,11	454 Ag.	Ruehe

Dairy Husbandry

7. Creamery Buttermaking and Factory Management.—Types of creameries; raw product received; grading; pasteurization; use of commercial starters; ripening; churning; salting; working butter. Butter composition; uniformity and methods of control; butter scoring. Creamery accounting and business methods; co-operative and centralized management; sale of creamery by-products; refrigerating; location and creamery plans; disposal of creamery sewage. This course is accompanied by one inspection trip, costing from \$10 to \$15. Lectures; assigned readings; laboratory practise. *II*; (5).

Prerequisite: Dairy Husbandry 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	7	5	—	1,2	1,2	1,2	1,2	1,2	—	454 Ag.	Hepburn and Lang
Husbandry				—	—	—	—	—	8,9,10	Creamery Lab.	

8. City Milk Supply.—Production, transportation, and delivery. *II*; (2).

Prerequisite: Dairy Husbandry 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	8	2	—	8	—	—	—	8	—	454 Ag.	Harding Lang
Husbandry											

11. Dairy Bacteriology.—The bacteria of milk and its products; methods of introduction, effect, and methods of control. Lectures. *I*; (2).

Prerequisite: Bacteriology 5.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	11	2	—	8	—	—	—	8	—	454 Ag.	Harding
Husbandry											

12a-12b. Dairy Bacteriology.—The bacteria in milk and its products. Laboratory. *I, II*; (4).

Prerequisite: Bacteriology 5.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	12a	4	—	—	8,9	8,9	8,9	—	8,9	454 Ag.	Harding Allen
Husbandry											

SECOND SEMESTER										
Dairy	12b	4	Schedule the same as for 12a (first semester).							
Husbandry										

16. Dairy Cattle Feeding and Management.—Compounding rations for dairy cows; preparation of feeds; study of station feeding tests; effects of feeds on milk products; calf raising, feeding, and general care; barn and silo arrangement with reference to storing and feeding. Opportunity is given to study the feeding of the University dairy herds, and the types of silos in use. (Alternates with Section A, Dairy Husbandry 1, if desired). *I*; (3).

Prerequisite: Animal Husbandry 6.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy	16	3	—	10	—	10	—	10	—	128 Ag.	Hulce
Husbandry											

Dairy Husbandry

17. Advanced Study of Dairy Breeds.—The origin and history of dairy breeds; their characteristics and producing abilities; prominent families and individuals; pedigree work with emphasis upon performance records; advanced registry system; problems peculiar to the breeder of pure-bred dairy cattle. The student may specialize in the breed in which he is interested. Lectures; assigned readings; seminar work. *I*; (2).

Prerequisite: Dairy Husbandry 2 and 16, and the permission of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Dairy Husbandry	17	2	—	—	3	—	3	—	128 Ag.	Crandall

[21. Systems of Dairy Farming.—Relation of the cow and the herd to profits; how to establish and perpetuate a dairy herd of the highest efficiency; economy of crops and rations on a dairy farm; systems of cropping; the organization of a dairy farm; location and arrangement of buildings and lots; farm accounts, records, and inventories; markets; care and disposal of milk at the greatest profit. *II*; (5). (Not given in 1915-16).

Prerequisite: Dairy Husbandry 2 and 16.]

22. Farm Dairying and Cheese Making.—Ripening and setting milk; cutting, cooking, and dipping curd; cheddaring, milling, matting, and salting curd; pressing and curing cheese; soft cheese; Neufchatel, cottage, pimento, cream cheese, and other varieties; practise in making the more common varieties. This course also includes the study of butter making under farm conditions; marketing farm butter; handling of cream on the farm; the care and use of the hand separator; various makes of machines; plans for farm dairy houses. *I*; (4).

Prerequisite: Dairy Husbandry 1.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Dairy Husbandry	22	4	—	1,2	—	1,2	—	1,2,3	—	} Hepburn Lang

Courses for Graduates

[101. Economic Milk Production.—Differences in the efficiency of dairy cows, their cause and effect, and their relation to successful dairy farming. *Twice a week. I, II; (1 unit).* Not given in 1915-16.

Professor FRASER]

[102. Research.—The investigations in progress in the dairy herds of the State. *I, II; (1 unit).* Not given in 1915-16.

Professor FRASER]

[103. Research.—Dairy feeding problems. *I, II; (1 unit).* Not given in 1915-16.

Professor FRASER]

104.—Dairy Bacteriology.—Lecture and research on assigned topics. *I, II; (2 units). Time to be arranged.*

Professor HARDING, Assistant Professor PRUCHA

DRAWING, GENERAL ENGINEERING

HARRY WILLARD MILLER, M.E., *Assistant Professor*

ROBERT KENT STEWARD, C.E., *Associate*

FRANCIS MARION PORTER, M.S., *Associate*

HARVEY HERBERT JORDAN, B.S., *Associate*

RUFUS CRANE, A.B., B.S., *Instructor*

CLARENCE ALLEN ATWELL, B.S., *Instructor*

ALBERT FRANK WESTLUND, B.S., *Instructor*

ROBERT EMMET MURPHY, *Half-time Assistant*

1. Elements of Drafting.—Lettering; isometric oblique and perspective drawing, orthographic projection; machine sketching; working drawings. Lettering; mechanical styles and the making of name plates and titles. Mechanical drawing; 12 plates from copy and 6 plates from models, with tracings of each. Dimensioned sketches from parts of standard machines; complete working drawings. Tracings duplicated in blue-print form. Time sketches of equipment. Miller's *Mechanical Drafting*. I or II; (4).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
G. E. D.	1	4	A	8-11	—	8-10	—	8-11	—	300 T. B.	} Miller and others
			B	1-4	—	1-3	—	1-4	—	300 T. B.	
			C	—	8-11	—	8-11	—	8-10	300 T. B.	
			D	—	1-4	—	1-4	—	10-12	300 T. B.	

SECOND SEMESTER								
A	8-11	—	8-10	—	8-11	—	—	Miller and others

2. Descriptive Geometry.—The point, line, and plane; the properties of surfaces; intersections and developments (for architects, perspective instead of intersections and developments). Practical problems; recitations. Three drawing room plates, 2 hours each, 5 problems per plate, and 2 home plates, 5 problems each per week. Miller's *Descriptive Geometry*. I or II; (4).

Prerequisite: Solid geometry, college algebra, plane trigonometry.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
G. E. D.	2	4	A	8-11	—	8-10	—	8-11	—	300 T. B.	Miller and others
			B	1-4	—	1-3	—	1-4	—	300 T. B.	
			C	—	8-11	—	8-11	—	8-10	300 T. B.	
			D	—	1-4	—	1-4	—	10-12	300 T. B.	

21. Advanced Descriptive Geometry.—Review of course 2; the cylinder, cone, convolute and warped surface; intersections of these surfaces in pairs, and by planes; planes tangent; developable and approximately developable surfaces and doubly curved and complex surfaces of revolution; practical applications and methods. II; (2).

Prerequisite: G. E. D. 1, 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
G. E. D.	21	2	—	—	—	—	2-4	2-4	8-12	300 T. B.	Porter

(Any 4 hours from above schedule).

ECONOMICS

(See also BUSINESS ORGANIZATION AND OPERATION, and TRANSPORTATION.)

DAVID KINLEY, Ph.D., LL.D., *Professor*
 MAURICE HENRY ROBINSON, Ph.D., *Professor*
 ERNEST LUDLOW BOGART, Ph.D., *Professor*
 NATHAN AUSTIN WESTON, Ph.D., *Assistant Professor*
 SIMON LITMAN, Dr. Jur. Pub. et Rer. Cam., *Assistant Professor*
 RALPH EMERSON HEILMAN, Ph.D., *Assistant Professor*
 CHARLES MANFRED THOMPSON, Ph.D., *Associate*
 JOHN GIFFEN THOMPSON, Ph.D., *Instructor*
 CHARLES LESLIE STEWART, Ph.D., *Instructor*
 WILLIAM HENRY DREESEN, A.B., *Assistant*
 EDWARD LAWRENCE MCKENNA, A.M., *Assistant*
 GEORGE BURR McMILLEN, A. B., *Assistant*

Major: For students in the College of Liberal Arts and Sciences twenty hours, made up of Economics 1 and any other courses for which it is a prerequisite.

Minor: Twenty hours in any one or two of the following subjects: history, philosophy, political science, and sociology.

Economics 7, 22, and 26 are open to freshmen without previous requirement. Economics 27 is also open to freshmen, but requires credit in course 26 or an approved high school course in commercial geography.

Economics 1 and 3 are the fundamental courses in economics. They are prerequisites for most of the advanced courses and students expecting to do advanced work in economics should take them both in their sophomore year.

Economics 2, though open to all students who have had 30 hours of university work, is primarily for students in the Colleges of Agriculture and Engineering and in courses in household science, chemistry, chemical engineering and other sciences. It may not be used as a prerequisite for advanced courses in economics except as indicated.

Courses for Undergraduates

1. **Principles of Economics.**—(See note preceding the description of courses in economics above.) I; (5).

Prerequisite: Thirty hours of University work.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Economics	1	5	Lecture	—	11	—	11	—	—	100 Com.	Heilman
			A, Quiz	8	—	8	—	8	—	307 Com.	Stewart
			B, Quiz	8	—	8	—	8	—	308 Com.	McMillen
			C, Quiz	8	—	8	—	8	—	111 Com.	McKenna
			D, Quiz	10	—	10	—	10	—	312 Com.	McMillen
			E, Quiz	10	—	10	—	10	—	206 Com.	Thompson, J. G.
			F, Quiz	11	—	11	—	11	—	101 Com.	Heilman
			G, Quiz	11	—	11	—	11	—	206 Com.	Thompson, J. G.
			H, Quiz	11	—	11	—	11	—	204 Com.	Thompson, C. M.
			I, Quiz	11	—	11	—	11	—	308 Com.	McKenna
			J, Quiz	11	—	11	—	11	—	307 Com.	Stewart

2. Principles of Economics.—(See note preceding the description of courses in economics above.) *II*; (3).

Prerequisite: Thirty hours of University work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	2	3	A	11	—	11	—	11	—	111 Com.	Robinson
			B	1	—	1	—	1	—	111 Com.	Thompson, J. G.
			C	3	—	3	—	3	—	101 Com.	Heilman
			D	3	—	3	—	3	—	307 Com.	Thompson, C. M.

3. Money and Banking.—The history and theory of money, credit, and banking. (See note preceding the description of courses in economics, page 158.) *II*; (3).

Prerequisite: Economics 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	3	3	Lecture	11	—	—	—	—	—	100 Com.	Weston
			A, Quiz	—	—	11	—	11	—	206 Com.	Weston
			B, Quiz	—	—	11	—	11	—	101 Com.	Stewart
			C, Quiz	—	11	—	11	—	—	101 Com.	Stewart
			D, Quiz	—	—	11	—	11	—	307 Com.	McKenna
			E, Quiz	—	11	—	11	—	—	307 Com.	McKenna

7. English Economic History.—The industrial development of England; the manorial system; the guilds; the commercial policy and expansion of the seventeenth and eighteenth centuries; the industrial and manufacturing growth of the nineteenth century. *Open to freshmen and sophomores only.* *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	7	3	Lecture	9	—	—	—	—	—	100 Com.	Bogart
			A, Quiz	—	—	9	—	9	—	101 Com.	Bogart
			B, Quiz	—	9	—	9	—	—	101 Com.	Bogart
			C, Quiz	—	—	9	—	9	—	111 Com.	Thompson, C. M.
			D, Quiz	—	9	—	9	—	—	111 Com.	Thompson, C. M.
			E, Quiz	—	—	9	—	9	—	308 Com.	Thompson, J. G.
			F, Quiz	—	2	—	2	—	—	111 Com.	Thompson, C. M.

16c. Agricultural Economics.—The application of the principles of economics to the problems of agriculture. *II*; (3).

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	16c	3	—	3	—	3	—	3	—	312 Com.	Thompson, J. G.

22. The Economic History of the United States.—The explorations and settlements that led to the colonization of this continent; the growth of industry, agriculture, commerce, transportation, and labor from the agricultural communities of the colonies to the industrial and commercial society of today. *Open to freshmen and sophomores only.* *II*; (3).

Economics

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	22	3	A, Lecture	9	—	—	—	—	—	100 Com.	Bogart
			B, Lecture	—	9	—	—	—	—	100 Com.	Bogart
			A, Quiz	—	—	9	—	9	—	101 Com.	Bogart
			B, Quiz	—	—	9	—	9	—	111 Com.	Thompson, C. M.
			C, Quiz	9	—	—	9	—	—	111 Com.	Thompson, C. M.
			D, Quiz	—	—	9	—	9	—	307 Com.	McMillen
			E, Quiz	9	—	—	9	—	—	307 Com.	McMillen
			F, Quiz	—	—	9	—	9	—	308 Com.	McKenna
			G, Quiz	9	—	—	9	—	—	101 Com.	Stewart
			H, Quiz	9	—	—	9	—	—	308 Com.	McKenna
			I, Quiz	—	10	—	10	—	—	101 Com.	Bogart
			J, Quiz	—	10	—	10	—	—	111 Com.	Stewart
			K, Quiz	—	2	—	2	—	—	111 Com.	Thompson, C. M.
			L, Quiz	—	2	—	2	—	—	101 Com.	McMillen

26. Economic Resources.—Environment influences affecting commercial and industrial development; products and industries of different countries; the extent and distribution of the resources and the industrial and commercial activities of the United States. *Open to freshmen and sophomores only. I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	26	3	Lecture	10	—	—	—	—	—	100 Com.	Litman
			A, Quiz	—	—	10	—	10	—	204 Com.	Litman
			B, Quiz	—	10	—	10	—	—	204 Com.	Litman
			C, Quiz	—	—	10	—	10	—	307 Com.	Dreesen
			D, Quiz	—	10	—	10	—	—	307 Com.	Dreesen
			E, Quiz	—	—	10	—	10	—	308 Com.	Stewart
			F, Quiz	—	10	—	10	—	—	308 Com.	Stewart
			G, Quiz	—	—	9	—	9	—	307 Com.	Dreesen
			H, Quiz	—	9	—	9	—	—	204 Com.	Litman
			I, Quiz	—	2	—	2	—	—	307 Com.	Dreesen
			J, Quiz	—	2	—	2	—	—	101 Com.	McKenna

27. Modern Industries.—The raw materials of commerce; their geographical distribution and economic significance; the leading industries which utilize these materials; sources of power; investment of capital; employment of men and of machinery; the progressive stages of production; the distribution of finished commodities. *Open to freshmen and sophomores only. II; (3).*

Prerequisite: Economics 26, or an approved high school course in commercial geography.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	27	3	Lecture	10	—	—	—	—	—	100 Com.	Litman
			A, Quiz	—	—	10	—	10	—	204 Com.	Litman
			B, Quiz	—	10	—	10	—	—	204 Com.	Litman
			C, Quiz	—	—	10	—	10	—	307 Com.	Dreesen
			D, Quiz	—	10	—	10	—	—	307 Com.	Dreesen
			E, Quiz	—	—	2	—	2	—	307 Com.	Dreesen
			F, Quiz	—	2	—	2	—	—	307 Com.	Dreesen

32. Marketing Farm Produce.—Prices of farm products; seasonal aspects; middlemen; speculation; transportation; terminal problems; regulative

and protective legislation; crop statistics; public markets; direct sales; contrast between European and American marketing conditions. *II*; (2).

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	32	2	—	—	3	—	3	—	—	307 Com.	Stewart

33. Economics of Insurance.—The historical development and economic aspects of insurance. *I*; (2).

Prerequisite: Economics 1 and 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	33	2	—	—	9	—	9	—	—	307 Com.	Robinson

34. Property Insurance.—Technical characteristics and economic effects of fire, marine, title, and credit insurance and corporative suretyship. *II*; (2).

Prerequisite: Economics 1 and 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	34	2	—	—	9	—	9	—	—	204 Com.	Robinson

Courses for Undergraduates and Graduates

4. Financial History of the United States.—Federal finances to the end of the Civil War; monetary, banking, and fiscal events since the War, and their influence on business. *I*; (3).

Prerequisite: Economics 1 and 3 and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	4	3	—	8	—	8	—	8	—	206 Com.	Weston

5. Public Finance.—Public expenditures; financial administration; taxation; public debts. *I*; (3).

Prerequisite: Economics 1 and 3. Students who have had 6 hours in history and Political Science 1, and who present a statement from the department of political science showing that they are taking political science as a major, may be admitted without Economics 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	5	3	—	10	—	10	—	10	—	101 Com.	Bogart

8. The Money Market.—Money and credit; the functions of money broker and banker; the concentration of financial dealings at such centers as New York and London; international payments and the determination of rates of foreign exchange; the seasonal demands for money; causes of fluctuation in rates of discount; monetary panics and crises; investments; the financial aspects of dealings on the stock and produce exchanges. *II*; (2).

Prerequisite: Economics 1 and 3, Business Organization and Operation 1, senior standing. For the present year former Economics 6 will be accepted instead of Business Organization and Operation 1.

Economics

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	8	2	—	—	8	—	8	—	—	206 Com.	Weston

9. Practical Banking.—Banking practise in the United States. *I*; (2).

Prerequisite: Economics 1 and 3, Business Organization and Operation 1, senior standing. For the present year former Economics 6 will be accepted instead of Business Organization and Operation 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	9	2	—	—	8	—	8	—	—	206 Com.	Weston

10. Corporation Management and Finance.—The growth, causes, and forms of corporations; the promotion, financiering, incorporation, and capitalization of corporate consolidations; their organization and securities; relation of stockholders and directors; analysis of reports; stock speculation; relations of industrial corporations to international competition; receiverships and reorganizations; social and political effects. *I*; (3).

Prerequisite: Economics 1 and 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	10	3	A	10	—	10	—	10	—	111 Com.	Robinson
			B	11	—	11	—	11	—	111 Com.	Robinson

11. Industrial Consolidation.—Industrial consolidation; the growth of monopoly, monopoly prices and methods, the ability of trusts to effect prices, wages, interests, and profits; and the proposed plans for controlling trusts. *II*; (3).

Prerequisite: Economics 10.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	11	3	—	10	—	10	—	10	—	111 Com.	Robinson

12a-12b. Labor Problems.—The relations of employer and employed; the development of trade unionism; policies of trade unions regarding wages, machinery, strikes, and collective bargaining; methods of industrial peace; unemployment and its remedies; labor legislation. *I, II*; (3).

Prerequisite: Open to graduates and seniors who have had Economics 1 and 3. Students who have had 6 hours in history and Sociology 1 and who present a statement from the department of sociology showing that they are taking sociology as a major, may be admitted without Economics 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	12a	3	—	2	—	2	—	2	—	206 Com.	Heilman

SECOND SEMESTER

Economics	12b	3	Schedule the same as for 12a (first semester).								
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13. Economic Development of Europe Since the Industrial Revolution.—The economic history of France, Germany, and England since the industrial revolution. *II*; (3).

Prerequisite: Sixty hours of university work, including Economics 1 and 3. Students who present a statement from the department of history showing that they are taking history as a major, may be admitted without Economics 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	13	3	—	10	—	10	—	10	—	206 Com.	Bogart

14. Agricultural Cooperation.—The organization, financing, and management of cooperative associations for the promotion of farming. *Open to junior and senior students of agriculture only. II; (2).*

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	14	2	—	—	2	—	2	—	—	206 Com.	Stewart

15. Rural Credit.—The credit and banking needs of farmers and rural communities and means of supplying them. *Open to junior and senior students of agriculture only. I; (2).*

Prerequisite: Economics 1 or 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	15	2	—	—	2	—	2	—	—	206 Com.	Stewart

17. Economic History of Agriculture.—The development of agriculture in various countries at various times. Land tenure and landed property; large, medium, and small farms or estates; economic conditions and results of extensive and intensive culture; agricultural credit and markets and labor; state of agricultural class; organization in agriculture, and its relation to other industries and to the state. *II; (2).*

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	17	2	—	—	3	—	3	—	—	312 Com.	Thompson, J. G.

19. United States Industry, 1820-1860.—Growth, distribution, and character of the population, with reference to the public domain and the westward movement; development of inland communication and transportation; foreign commerce and the carrying trade; distribution, extent, and methods of agriculture; manufacturing, labor and labor saving machinery; currency and banking; the tariff. *I; (2).*

Prerequisite: Open to graduates and seniors who have had Economics 1 and are taking a major in one of the social sciences.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	19	2	—	—	10	—	10	—	—	206 Com.	Thompson, C. M.

20. United States Industry Since 1860.—Improved methods of agriculture and the effect of exploiting new lands; the factory system; organized labor; evolution of "big business"; growth of urban centers; mining; economic

Economics

effects of immigration; monetary questions; railroads and the regulation of interstate trade; foreign commerce; the tariff. *II*; (2).

Prerequisite: Open to graduates and seniors who have had Economics 1 and are taking a major in one of the social sciences.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	20	2	—	—	10	—	10	—	—	206 Com.	Thompson, C. M.

21. Socialism and Economic Reform.—Proposed reforms affecting the economic basis of society. The theories of socialism, communism, and syndicalism; recent modifications of the Marxian philosophy; the socialist movement in its political aspects; communistic experiments; social insurance. *II*; (2).

Prerequisite: Economics 1 and 3. Students who have had 6 hours in history and Sociology 1 and who present a statement from the department of sociology showing that they are taking sociology as a major may be admitted without Economics 3.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	21	2	—	—	8	—	8	—	—	307 Com.	Heilman

28. Mechanism and Technique of Domestic Commerce.—Internal trade; wholesale and retail trade organizations; markets, fairs, auctions, stock and produce exchanges; department, mail-order, and cooperative stores; commercial travelers; commercial competition; modern advertising; mercantile credit. *I*; (3).

Prerequisite: Economics 1 and 3.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	28	3	—	9	—	9	—	9	—	204 Com.	Litman

29. Foreign Commerce and Commercial Politics.—Problems of international trade; changes in theories and in policies; economic systems (mercantile, free trade, protective); classes of customs tariffs; commercial treaties; history of tariff legislation in the United States. *II*; (3).

Prerequisite: Economics 28.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	29	3	—	9	—	9	—	9	—	204 Com.	Litman

[31. Organization of Foreign Commerce.—Exporting and importing; ocean transportation; line and charter traffic; institutions for furthering export trade; the consular service; entry of goods; the work of the custom house. *II*; (3). Not given in 1915-16.

Prerequisite: Economics 28.]

51. Public Utilities.—Relations of the public to public service corporations; methods of regulation; methods of control over accounting, capitalization, and service; valuation and rate making; comparisons of recent decisions of commissions; tendencies in regulation. *I*; (3).

Prerequisite: Open to graduates and seniors who have had Economics 10.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Economics	51	3	—	9	—	9	—	9	—	206 Com.
										Instructor Heilman

Courses for Graduates

Students entering upon graduate work in economics must have had a thoro course in the principles of the science and should also have studied some special part of the field, such as public finance or money and banking.

[101. **Economic Theory.**—*Twice a week. I, II; (1 unit).* Not given in 1915-16.]

102. **Theory of Money, Credit and Prices.**—*Twice a week. I, II; (1 unit).*

BOTH SEMESTERS										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Economics	102	1 unit	—	—	9	—	9	—	—	206 Com.
										Instructor Kinley

104. **Foreign Commerce of the United States.**—The foreign commerce of the United States as shown in government publications. *Twice a week. II; (1 unit). Time to be arranged.* Assistant Professor LITMAN

105. **Public Finance.**—The history and theory of public revenue and expenditure. *Twice a week. I, II; (1 unit). Time to be arranged.*

Professor BOGART

107. **The Corporation in Economic Evolution.**—*Twice a week. I, II; (1 unit). Time to be arranged.* Professor ROBINSON

[109. **Theory of Industrial Consolidations.**—The nature of industrial consolidations; the conditions and causes responsible for their development and their effects upon the production and distribution of wealth. *Twice a week. I, II; (1 unit).* Not given in 1915-16.]

118. **Seminar.**—*I, II. Time to be arranged.* Professor KINLEY

120. **History of Economic Thought.**—*Twice a week. I, II; (1 unit). Time to be arranged.* Dr. J. G. THOMPSON

[122. **Advanced Economic History of the United States.**—*Twice a week. I, II; (1 unit).* Not given in 1915-16.]

EDUCATION

WILLIAM CHANDLER BAGLEY, Ph.D., *Professor*

CHARLES HUGHES JOHNSTON, Ph.D., *Professor*

HORACE ADELBERT HOLLISTER, A.M., *Professor*

GUY MONTROSE WHIPPLE, Ph.D., *Professor*

JOSEPH CLIFTON BROWN, A.M., *Principal of the Training School*

WILFORD STANTON MILLER, A.M., *Assistant and Secretary*

MARGARET VARA COBB, A.M., *Assistant*

HARRIET JOSEPHINE BERNINGER, A.B., *Assistant*

Introductory Courses

1. **Introduction to Education.**—(a) The American public-school system; (b) the principles and aim of education; the biological basis, heredity, and en-

Education

vironment; instinct, habit, and habit-formation; memory, and the higher mental processes. (This course is by Senate ruling required of all students who are given the official indorsement of the Appointments Committee for teaching positions in secondary schools.) *I* or *II*; (4).

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	1	4	A	1	1	1	1	—	—	202 L. H.	Bagley
			B	2	2	2	2	—	—	202 L. H.	Miller
SECOND SEMESTER											
			—	1	1	1	1	—	—	202 L. H.	Bagley Miller

2. History of Education.—History of the evolution of educational theory, institutions, and practise as related to the contemporary developments of the Greek, Roman, medieval and modern civilizations. *II*; (5).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	2	5	—	9	9	9	9	9	—	202 L. H.	Johnston

Intermediate Courses

10. The Technique of Teaching.—Types of classroom exercises and preparation of teaching plans; the hygiene of instruction; classroom management; professional ethics. Observation of teaching in neighboring high schools. (This course with Education 1 is, by Senate ruling, required of all students who are given the official recommendation of the Appointments Committee for teaching positions in secondary schools). *I* or *II*; (3).

Prerequisite: Education 1.

				FIRST SEMESTER							
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Education	10	3	A	2	—	2	—	2	—	202 L. H.	Brown
			B	3	3	3	—	—	—	202 L. H.	Bagley
				SECOND SEMESTER							
			A	2	—	2	—	2	—	313 L. H.	Brown
			B	3	—	3	—	3	—	308 L. H.	Brown

16. Social Education.—The school as a social factor in its relation to the home, the church, and the state; the relation of education to child labor, vocation, and crime; the school as a community center; the social composition of student—and teaching—populations; educational extension. *I*; (3).

Prerequisite: Two years of university work.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	16	3	—	10	—	10	—	10	—	202 L. H.	Brown

25. Educational Psychology.—(An introductory course). Instinct; habit and the acquisition of skill; perception and memory; conception, judgment, and reasoning. Lectures and demonstrations. *I*; (3).

Prerequisite: Psychology 1 or Education 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	25	3	—	9	—	9	—	9	—	(Arrange)	Whipple

Courses for Advanced Undergraduates and Graduates

4. Problems of Educational Administration.—The interpretation of present tendencies as exemplified in the school systems of typical cities and states, and in recent educational experiments in administration, discipline, and methods of teaching. *I*; (3).

Prerequisite: Education 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	4	3	—	11	—	11	—	11	—	113 L. H.	Brown

5. Comparative Education.—Organization, administration, and basic national ideals of the school systems of the United States, Germany, England, and France, with reference to secondary education and to the training of teachers. *I*; (3).

Prerequisite: Education 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	5	3	—	9	—	9	—	9	—	113 L. H.	Johnston

6. Principles of High-school Education.—The evolution of high schools and of the fundamental conceptions of secondary education; proposed reorganization; relation of high schools to the state systems; legal status; articulation with the elementary school, the college, the technical school, the community, and the home; the teaching staff; reconstruction of curriculums; "controls" of instruction; direction of "student activities". This course is planned for those who expect to teach in secondary schools. *I*; (3).

Prerequisite: Education 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	6	3	—	10	—	10	—	10	—	113 L. H.	Johnston

27. High-school Curriculums.—Important historic curriculums for secondary education; modern curriculum-making; professional supervision; textbooks, apparatus, and teaching devices; the psychology of high-school subjects; the constructing of curriculums for typical communities. *II*; (3).

Prerequisite: Education 1 or 6 (preferably both).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	27	3	—	10	—	10	—	10	—	113 L. H.	Johnston

13-14. Educational Classics.—The principal educational writings of Plato, Aristotle, Quintilian, Montaigne, Vittorino, Da Feltre, Milton, Locke, Comenius, Rousseau, Pestalozzi, Froebel, and Herbert Spencer. (Required for advanced degrees in education.) In 1915-16 the modern period will constitute Course 13; the ancient period Course 14. *I, II*; (3).

Prerequisite: Education 1, 2.

Education

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	13	3	—	11	—	11	—	11	—	103 L. H.	Whipple

SECOND SEMESTER										
Education	14	3	—	11	—	11	—	11	—	103 L. H. Brown

15. School Hygiene.—The hygienic aspects of school architecture and equipment; the heating, ventilation, and lighting of school buildings; the hygiene of posture, exercise, and fatigue, and of reading and writing; the bearing of hygienic principles upon the program of studies and the daily time table; the mental health of teachers and pupils; contagious diseases and the relation of school authorities to health authorities. (Graduate credit subject to approval of Executive Faculty). *II*; (2).

Prerequisite: Education 1 or normal-school graduation, or two years of teaching experience, with at least junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	15	2	—	—	3	—	3	—	—	(Arrange)	Whipple

18. Method in Educational Research.—Statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees). *I*; (2).

Prerequisite: Education 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	18	2	—	—	2	—	2	—	—	113 L. H.	Brown

20a. Theory of Supervision.—The problems involved in the training of teachers in service; methods of measuring educational products; qualities of merit and causes of failure in teachers; selection of teachers; organization of teachers' meetings and other agencies for improving the teaching service. *II*; (3).

Prerequisite: Education 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	20a	3	—	2	2	2	—	—	—	113 L. H.	Bagley

[20b. Theory and Practise of Supervision.—Identical with 20a except for the addition of a period each week devoted to the observation and criticism of teaching in elementary and high schools. *II*; (3). Not given in 1915-16.

Prerequisite: Education 1.]

41. Vocational Education.—The social significance of vocational education; institutions and methods of vocational education in elementary and secondary schools; federal, state, and municipal provisions; recent legislation; present tendencies. *I*; (3).

Prerequisite: Education 1 or an equivalent satisfactory to the instructor.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	41	3	—	3	—	3	—	—	—	117 L. H.	Johnston

42. Auxiliary Education.—The institutions and methods for the training of defectives and delinquents; the Binet-Simon tests and other methods of mental diagnosis; educational treatment of morons and of moral delinquents; methods of teaching sensory defectives (the blind and the deaf); public institutions of auxiliary education and their administration. *II; (2).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	42	2	—	—	9	—	9	—	—	417 U. H.	Whipple

43. Mental Tests.—Laboratory drill in the technique of mental tests, including tests of sensory capacities; attention; memory; learning; suggestibility; inventiveness; systems of tests for diagnosis of mental age; general intellectual status; mental retardation; etc. *II; (2).*

Prerequisite: Education 25 or the equivalent, and the consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	43	2	—	—	10,11	—	10,11	—	—	417 U. H.	Whipple

45. Problems in Educational Psychology.—*II; (2).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	45	2	—	—	—	—	—	—	—	417 U. H.	Whipple

(Arrange)

Courses for Graduates

101. Seminar in Educational Theory.—The topic of the seminar in the fall of 1915 will be the higher mental processes in their relation to a philosophy of education. *I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	101	1 unit	—	—	7-9	—	—	—	—	103 L. H.	Bagley Bode

[105. Seminar in History of Education.—Not given in 1915-16.]

106. Seminar in Secondary Education.—Organization, administration, and special methods of secondary education. Reports and discussions of technical investigations in the fields of high school administration and pedagogy. *II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	106	1 unit	—	—	—	—	4,5	—	—	103 L. H.	Johnston

[108. The History of Vocational and Industrial Education.—*II; (1 unit).* Not given in 1915-16.]

[104. Seminar in Administration and Supervision.—*Once a week. II; (1 unit).* Not given in 1915-16.]

112. Principles of Education.—For graduate students who are not majoring in education and who have not taken undergraduate courses in education. The course involves: (a) a survey of the American public-school system; (b) a statement of the leading principles and doctrines of educational science; and

Electrical Engineering

(c) a brief reference to the technique of teaching and the problems of class management. *Twice a week. II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	112 $\frac{1}{2}$ unit	—	3	—	3	—	—	—	103 L. H.	Bagley

119. The Elementary Curriculum.—The functions and values of elementary-school studies; time allotments; practical exercises in the construction of curriculums. *Twice a week. II; (1 unit).*

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	119 1 unit	—	10	—	10	—	—	—	103 L. H.	Brown

125. Seminar in Educational Psychology.—The topic of the seminar for 1915-16 will be announced later. *Once a week. I; (1 unit).*

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	125 1 unit	—	—	—	4,5	—	—	—	417 U. H.	Whipple

Departmental Conference.—All graduate students majoring in education are expected to meet with the departmental staff every alternate Monday from 7 to 9 p. m. *I, II; (no credit).*

ELECTRICAL ENGINEERING

ELLERY BURTON PAINE, M.S., E.E., *Professor, Acting Head of the Department*

MORGAN BROOKS, Ph.B., M.E., *Professor*

EDWARD HARDENBERGH WALDO, A.B., M.S., M.E., *Assistant Professor*

PHILIP SHERIDAN BIEGLER, B.S., E.E., *Assistant Professor*

LEONARD VAUGHAN JAMES, M.S., E.E., *Associate*

IRA WILLIAM FISK, M.S., E.E., *Associate*

ABNER RICHARD KNIGHT, M.E., *Associate*

CHARLES RUBY MOORE, B.S., *Associate*

JOHN WILLIAMS DAVIS, B.S., *Instructor*

4. Elementary Electrical Engineering.—Electrical machinery; selection, installation, and operation; distribution of power; motor applications. *II; (2).*

Prerequisite: Physics 1a-1b, 3a-3b; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	4	2	FT	—	1	—	1	—	—	205 E. L.	} Brooks
			O	—	9	—	9	—	—	205 E. L.	

8. Electric Currents and Apparatus.—Direct and alternating current circuits and machines; storage batteries. (Especially for chemical engineers.) *II; (3).*

Prerequisite: Physics 1a-1b, 3a-3b; registration or credit in Mathematics 7; registration in Electrical Engineering 68.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	8	3	Z	8	—	8	—	8	—	203 E. L.	} Brooks Davis

Electrical Engineering

11. Direct Current Apparatus.—Generators, motors, distribution circuits; storage batteries. (For mechanical engineers.) *I*; (3).

Prerequisite: Physics 1a-1b, 3a-3b, Mathematics 8 or 9.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	11	3	P	8	—	8	—	8	—	207 E. L.	} Brooks
			Q	9	—	9	—	9	—	207 E. L.	

12. Alternating Current Apparatus.—Generators and motors, transformers, distribution systems. (For mechanical engineers.) *II*; (3).

Prerequisite: Electrical Engineering 11, 61.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	12	3	P	8	—	8	—	8	—	207 E. L.	} Brooks
			Q	9	—	9	—	9	—	207 E. L.	

14. Alternating Current Apparatus.—Transformers and generators. *I*; (4).

Prerequisite: Electrical Engineering 26, 76.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
<i>E. E.</i>	14	4	K	—	11	11	11	11	—	203 E. L.	} Paine James Fisk
			L	10	10	10	10	—	—	205 E. L.	
			M	9	—	9	9	9	—	203 E. L.	
			N	8	8	8	—	8	—	205 E. L.	

17. Alternating Current Apparatus.—Synchronous, induction, and commutator motors; rotary converters; distributed inductance and capacity; transient phenomena. *II*; (4).

Prerequisite: Electrical Engineering 14, 24.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E.E.	17	4	K	—	11	11	11	11	—	203 E. L.	} Paine James Fisk
			L	10	10	10	10	—	—	205 E. L.	
			M	9	—	9	9	9	—	203 E. L.	
			N	8	8	8	—	8	—	205 E. L.	

24. Electrical Engineering Laboratory.—Advanced alternating current testing. *I*; (2).

Prerequisite: Electrical Engineering 76; registration in Electrical Engineering 14.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	24	2	KN	—	9	—	—	—	—	207 E. L.	} Biegler Moore Davis
			LM	—	8	—	—	—	—	207 E. L.	
			K	—	—	—	—	1-4	—	200 E. L.	
			L	—	—	—	—	8-11	—	200 E. L.	
			M ₁	1-4	—	—	—	—	—	200 E. L.	
			M ₂	—	1-4	—	—	—	—	200 E. L.	
			N ₁	—	—	1-4	—	—	—	200 E. L.	
			N ₂	—	—	—	9-12	—	—	200 E. L.	

Electrical Engineering

25. Direct Current Apparatus.—Laws of electric and magnetic circuits; construction and operation of direct current generators and motors. *I*; (4).

Prerequisite: Physics 1a-1b, 3a-3b; Mathematics 9.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	25	4	K	10	10	10	—	10	—	207 E. L.	James Fisk Knight
			L	11	—	11	11	11	—	206 E. L.	
			M	8	8	8	8	—	—	206 E. L.	
			N	—	9	9	9	9	—	206 E. L.	

26. Alternating Currents.—A mathematical and graphical treatment of the principles of periodic currents; theory of the simple phenomena in transmission lines and transformers. *II*; (4).

Prerequisite: Electrical Engineering 25.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	26	4	K	10	10	10	—	10	—	207 E. L.	James Fisk Knight
			L	11	—	11	11	11	—	206 E. L.	
			M	8	8	8	8	—	—	206 E. L.	
			N	—	9	9	9	9	—	206 E. L.	

27. Electrical Engineering Laboratory.—Advanced alternating current testing. *II*; (2).

Prerequisite: Electrical Engineering 24; registration in Electrical Engineering 17.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	27	2	KM	—	8	—	—	—	—	207 E. L.	Biegler Moore Davis
			LN	—	11	—	—	—	—	206 E. L.	
			K	—	—	—	—	1-4	—	200 E. L.	
			L	—	—	—	—	8-11	—	200 E. L.	
			M ₁	1-4	—	—	—	—	—	200 E. L.	
			M ₂	—	—	1-4	—	—	—	200 E. L.	
			N ₁	—	1-4	—	—	—	—	200 E. L.	
			N ₂	—	—	—	9-12	—	—	200 E. L.	

55. Electrical Design.—Electromagnets and dynamos, direct and alternating; transformers. *I*; (2).

Prerequisite: Electrical Engineering 26; registration in Electrical Engineering 14.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	55	2	KLMN	—	—	—	8	—	—	207 E. L.	Waldo Knight
			K	1-4	—	—	—	—	—	204 E. L.	
			L	—	—	1-4	—	—	—	204 E. L.	
			M ₁	—	—	—	—	1-4	—	204 E. L.	
			M ₂	—	9-12	—	—	—	—	204 E. L.	
			N ₁	—	—	—	—	—	8-11	204 E. L.	
			N ₂	—	1-4	—	—	—	—	204 E. L.	

56. Electrical Design.—Induction motors and converters; power plant design. Gebhardt's *Steam Power Plant Engineering*. *II*; (4).

Prerequisite: Electrical Engineering 14.

Electrical Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	56	4	KLMN	—	9	—	8	—	—	207 E. L.	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 5px;">}</div> <div>Waldo Knight</div> </div>
			K	—	—	8	—	—	—	204 E. L.	
			L	—	—	9	—	—	—	204 E. L.	
			M	—	—	10	—	—	—	204 E. L.	
			N	—	—	11	—	—	—	204 E. L.	
			K	1-4	—	—	—	—	—	204 E. L.	
			L	—	1-4	—	—	—	—	204 E. L.	
			M ₁	—	—	1-4	—	—	—	204 E. L.	
			M ₂	—	—	—	—	1-4	—	204 E. L.	
			N ₁	—	—	—	9-12	—	—	204 E. L.	
			N ₂	—	—	—	—	—	8-11	204 E. L.	

61. Direct Current Laboratory.—Circuits and machines. (For mechanical engineers.) *I*; (1).

Prerequisite: Registration in Electrical Engineering 11.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	61	1	P	—	8-11	—	8-11	—	—	200 E. L.	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 5px;">}</div> <div>Biegler Moore Davis</div> </div>
			Q	—	2-5	—	—	—	8-11	200 E. L.	

62. Alternating Current Laboratory.—Alternating current circuits and machines. (For mechanical engineers.) *II*; (1).

Prerequisite: Registration in Electrical Engineering 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	62	1	PQ	—	1-4	—	1-4	—	8-11	200 E. L.	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 5px;">}</div> <div>Biegler Moore Davis</div> </div>

64. Electrical Engineering Laboratory.—Testing of dynamos and motors. *II*; (1).

Prerequisite: Registration in Electrical Engineering 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	64	1	F	—	—	1-4	—	—	—	200 E. L.	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 5px;">}</div> <div>Biegler Moore Davis</div> </div>
			O	—	—	—	1-4	—	—	200 E. L.	
			T	9-12	—	—	—	—	—	200 E. L.	

68. Electrical Engineering Laboratory.—Direct and alternating current circuits and machines. *II*; (1).

Prerequisite: Registration in Electrical Engineering 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	68	1	Z ₁	—	8-11	—	—	—	—	200 E. L.	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 5px;">}</div> <div>Davis</div> </div>
			Z ₂	—	—	—	8-11	—	—	200 E. L.	

71-72. Electrical Engineering Laboratory.—The construction of special apparatus or other work approved by the department. (Elective for juniors and seniors.) *I, II*; *(1 to 3). *Time to be arranged.* Mr. MOORE

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Electrical Engineering

75. Electrical Engineering Laboratory.—Direct current laboratory accompanying Electrical Engineering 25. *I*; (2).

Prerequisite: Registration in Electrical Engineering 25.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	75	2	KL	—	—	—	—	9	—	207 E. L.	Biegler Davis
			MN	—	—	—	—	11	—	206 E. L.	
			K	—	—	—	—	—	8-11	200 E. L.	
			L ₁	1-4	—	—	—	—	—	200 E. L.	
			L ₂	—	—	—	1-4	—	—	200 E. L.	
			M ₁	9-12	—	—	—	—	—	200 E. L.	
			M ₂	—	—	9-12	—	—	—	200 E. L.	
			N	—	—	1-4	—	—	—	200 E. L.	

76. Electrical Engineering Laboratory.—Determination of the flux and E.M.F. waves of alternators. Alternating current circuits, instruments. *II*; (2).

Prerequisite: Electrical Engineering 25, 75; registration in Electrical Engineering 26.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	76	2	LN	—	—	—	10	—	—	207 E. L.	Biegler Davis
			KM	—	—	—	—	11	—	207 E. L.	
			K	—	—	—	—	—	8-11	200 E. L.	
			L	—	9-12	—	—	—	—	200 E. L.	
			M ₁	9-12	—	—	—	—	—	200 E. L.	
			M ₂	—	—	9-12	—	—	—	200 E. L.	
			N ₁	1-4	—	—	—	—	—	200 E. L.	
			N ₂	—	—	—	—	1-4	—	200 E. L.	

90. Lighting.—Electric lamps and other illuminants, and their effective use; interior wiring; methods of distribution. (For architects.) *II* (half semester only); (1).

Prerequisite: Junior standing.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
E. E.	90	1	—	—	8	—	8	—	—	E. H.	Brooks

92. Lighting and Wiring.—First half of semester same as E. E. 90. Further study of distribution, fusing, Underwriters' Rules; motors. (For architectural engineers.) *II*; (2).

Prerequisite: Junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	92	2	—	—	8	—	8	—	—	E. H.	Brooks

95-96. Seminar.—Electrical railroading; illumination; telegraphy; telephony; storage batteries; electric metallurgy. *I, II*; (1).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	95	1	KLMN	—	—	—	1-3	—	—	206 E. L.	Paine

SECOND SEMESTER

96 1 Schedule the same as for 95 (first semester).

The English Language and Literature

98. Thesis.—First semester, preliminary reading and investigation; second semester, completion. *II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	98	3	—							E. L.	Members of the department

Courses for Graduates

Entrance upon graduate work in electrical engineering presupposes the full undergraduate course in that subject.

101. Advanced Course in Alternating Currents.—The theory of Transient Phenomena; polyphase circuits; measuring apparatus. *Twice a week; I, II; (1½ units). Time to be arranged.* Professor PAINE

103. Electrical Design.—Plans for an electrical machine or apparatus of specified character; or for the arrangement of an electrical plant; or for the installation of such machinery or apparatus. *Twice a week; II; (1 unit). Time to be arranged.* Assistant Professor WALDO

104. Telegraphy and Telephony.—*Once a week; I, II; (1 unit). Time to be arranged.* Professor BROOKS

105. Electrical Engineering Research.—Investigation of electrical phenomena, or tests of some electrical machine, or of a plant of such machines. *Twice a week; I, II; (1 to 3 units). Time to be arranged.* Professor PAINE

106. Illumination.—*Once a week; I, II; (1 unit). Time to be arranged.* Professor BROOKS

ENGINEERING

(See ARCHITECTURE, CIVIL ENGINEERING, DRAWING, ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING, MECHANICS, MINING ENGINEERING, MUNICIPAL AND SANITARY ENGINEERING, PHYSICS, RAILWAY CIVIL ENGINEERING, RAILWAY ELECTRICAL ENGINEERING, and RAILWAY MECHANICAL ENGINEERING.)

THE ENGLISH LANGUAGE AND LITERATURE

(Including RHETORIC and PUBLIC SPEAKING)

STUART PRATT SHERMAN, Ph.D., *Professor, and Chairman*

DANIEL KILHAM DODGE, Ph.D., *Professor*

THOMAS ARKLE CLARK, B.L., *Professor*

EDWARD FULTON, Ph.D., *Associate Professor*

EDWARD CHAUNCEY BALDWIN, Ph.D., *Assistant Professor*

HARRY GILBERT PAUL, Ph.D., *Assistant Professor*

FRANKLIN WILLIAM SCOTT, Ph.D., *Assistant Professor, Secretary*

HARRIE STUART VEDDER JONES, Ph.D., *Assistant Professor*

JACOB ZEITLIN, Ph.D., *Associate*

CHARLES HENRY WOOLBERT, A.M., *Associate*

The English Language and Literature

HERBERT LESOURD CREEK, Ph.D., *Associate*
CLARENCE VALENTINE BOYER, Ph.D., *Associate*
GERTRUDE SCHOEPFERLE, Ph.D., *Associate*
HARRY FRANKLIN HARRINGTON, A.M., *Associate*
MARTHA JACKSON KYLE, A.M., *Instructor*
CLARISSA RINAKER, Ph.D., *Instructor*
EASLEY STEPHEN JONES, A.M., *Instructor*
MERVIN JAMES CURL, A.M., *Instructor*
HARRISON MCJOHNSTON, A.M., *Instructor*
HAROLD M HILLEBRAND, Ph.D., *Instructor*
EARLE STANLEY ALDEN, A.M., *Instructor*
ROBERT CALVIN WHITFORD, A.M., *Instructor*
LYNN HAROLD HARRIS, Ph.D., *Instructor*
RALPH EARLE TIEJE, A.M., *Instructor*
CARL SAWYER DOWNES, Ph.D., *Instructor*
WILLIAM EBEN SCHULTZ, Ph.D., *Instructor*
ALLEN GREGORY, Ph.D., *Instructor*
SIGURD OSBORN HUSTVEDT, Ph.D., *Instructor*
ROGER SHERMAN LOOMIS, B.Litt., A.M., *Tutor*
SADA ANNIS HARBARGER, A.M., *Assistant*
RUTH KELSO, A.M., *Assistant*
LEW R SARETT, A.B., *Assistant*
EMERSON GRANT SUTCLIFFE, A.B., *Assistant*
THOMAS BLAINE STANLEY, A.B., *Assistant*
RAYMOND EPHRAIM DIXON, A.M., *Assistant*
CLYDE BYRON BECK, A.B., *Assistant*
JAMES MANLEY PHELPS, A.B., *Assistant*
CARRYL NELSON THURBER, A.B., *Assistant*
MYRTLE AMY CRUZAN, A.B., *Assistant*

Major: 20 hours in English excluding Rhetoric 1, 2 and English 10, and including at least 10 hours in English literature, at least 3 hours in composition, and at least 1 one-year course, or its equivalent, from the advanced group of courses.

Minor: 20 hours in either (a) one foreign language; or (b) in any two foreign languages; or (c) in one foreign language and philosophy; or (d) in one foreign language and history.

A. LITERATURE AND LANGUAGE

Elementary Courses

1-2. Survey of English Literature.—(Credit is not given for either semester separately, nor for the course in addition to course 10 or course 20.) I, II; (4).

Prerequisite: One year of college work.

The English Language and Literature

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	1	4	1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	Sherman
			A Discussion	8	—	8	—	—	—	302 U. H.	Hillebrand
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ¹ Discussion	2	—	2	—	—	—	307 U. H.	Hillebrand
			F ² Discussion	2	—	2	—	—	—	314 U. H.	Rinaker
			K Discussion	—	8	—	8	—	—	307 U. H.	Creek
			N ¹ Discussion	—	11	—	11	—	—	308 U. H.	Baldwin
			N ² Discussion	—	11	—	11	—	—	314 U. H.	Schoepperle
O Discussion	—	1	—	1	—	—	307 U. H.	Schoepperle			
SECOND SEMESTER											
English	2	4	1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	Sherman
			A Discussion	8	—	8	—	—	—	302 U. H.	Creek
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ¹ Discussion	2	—	2	—	—	—	314 U. H.	Rinaker
			F ² Discussion	2	—	2	—	—	—	308 U. H.	Schoepperle
			K Discussion	—	8	—	8	—	—	307 U. H.	Hillebrand
			N ¹ Discussion	—	11	—	11	—	—	314 U. H.	Baldwin
			N ² Discussion	—	11	—	11	—	—	302 U. H.	Hillebrand
O Discussion	—	1	—	1	—	—	307 U. H.	Schoepperle			

10-11. Introduction to Literature.—10 (*first semester*): The Forms of Poetry. 11 (*second semester*): The Forms of Prose Literature. (This course is intended only for those who expect to include a considerable amount of literature, in English or in some other language, in their curriculum. Credit is not given for the course in addition to course 1 or course 20. One semester's work is credited toward a major in English. Credit is not given for the first semester separately.) *I, II; (3).*

Prerequisite: The minimum entrance requirements in English.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	10	3	A	8	—	8	—	8	—	214 U. H.	Paul
			B	9	—	9	—	9	—	302 U. H.	Zeitlin
			C	10	—	10	—	10	—	302 U. H.	Dodge
SECOND SEMESTER											
English	11	3	A	8	—	8	—	8	—	214 U. H.	Loomis
			B	9	—	9	—	9	—	302 U. H.	Zeitlin
			C	10	—	10	—	10	—	302 U. H.	Dodge

12-13. American Literature.—(Credit is not given for either semester separately.) *I, II; (2).*

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Instructor
English	12	2	—	—	1	—	1	—	—	418 U. H. Paul
SECOND SEMESTER										
English	13	2	—	Schedule the same as for 12 (first semester).						

17. The English Language.—History, characteristics, and usage of modern English. *I; (3).*

Prerequisite: Rhetoric 1-2.

The English Language and Literature

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	17	3	—	2	—	2	—	2	—	121 L. H.	Fulton

20. Chief English Writers.—Offered only for those whose program admits of but one semester's work in English, and who therefore may not register for English 1. It is not accepted, like course 1, as a prerequisite for more advanced courses. Credit is not given for the course in addition to course 1 or course 10. *I* or *II*; (4).

Prerequisite: One year of college work.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	20	4	B	9	9	9	9	—	—	315 U. H.	Jones, E. S.
			D	11	11	11	11	—	—	315 U. H.	Loomis
			E	1	1	1	1	—	—	315 U. H.	Boyer
			G ¹	3	3	3	3	—	—	315 U. H.	Boyer
			G ²	3	3	3	3	—	—	214 U. H.	—
			G ³	3	3	3	3	—	—	— U. H.	Whitford
SECOND SEMESTER											
			B	9	9	9	9	—	—	315 U. H.	Jones, E. S.
			E	1	1	1	1	—	—	315 U. H.	Boyer
			G ¹	3	3	3	3	—	—	315 U. H.	Boyer
			G ²	3	3	3	3	—	—	214 U. H.	—

23. Introduction to Shakespeare.—*I* or *II*; (3).

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
English	23	3	—	2	—	2	—	2	—	315 U. H.	Sherman
SECOND SEMESTER											
			—	2	—	2	—	2	—	315 U. H.	Hillebrand

Intermediate Courses

Prerequisite: Eleven hours of English literature, or eight hours of English literature and eight hours of a foreign language.

21-22. Literary Study of the Bible.—Hebrew literature as an expression of the life of the race that produced it; the debt, both ethical and artistic, of modern life to ancient Hebrew thought. (Either semester may be taken separately). *I*, *II*; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	21	3	—	10	—	10	—	10	—	307 U. H.	Baldwin

SECOND SEMESTER			
English	22	3	Schedule the same as for 21 (first semester).

24. English Literature of the Victorian Period.—*II*; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	24	3	—	11	—	11	—	11	—	308 U. H.	Kyle

29. English Literature From 1557 to 1688, Exclusive of the Drama.—*I*; (3).

The English Language and Literature

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	29	3	—	—	10	—	10	—	—	307 U. H.	Baldwin

31. English Literature From 1688 to 1789.—II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	31	3	—	—	11	—	11	—	—	110 L. H.	Paul

32. The Critical Essayists of the 19th Century.—II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	32	3	—	2	—	2	—	2	—	307 U. H.	Fulton

33. English Literature From 1789 to 1837.—I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	33	3	—	11	—	11	—	11	—	307 U. H.	Zeitlin

Advanced Courses for Undergraduates and Graduates

Prerequisite: Sixteen hours of English literature. These courses, however, are open to any junior or senior with the approval of the instructor concerned.

3. The Poetry of Milton.—Origins, forms, artistic and ethical values; Milton's place in English literary history. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	3	3	—	—	10	—	10	—	—	110 L. H.	Baldwin

4. History and Principles of English Versification.—I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	4	2	—	—	10	—	10	—	—	110 L. H.	Creek

5. Shakespeare.—Intensive study of a few plays, with special emphasis on *Hamlet*. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	5	3	—	9	—	9	—	9	—	110 L. H.	Dodge

25-26. Chaucer and His Contemporaries.—(The first semester, dealing with Chaucer exclusively, may be taken for separate credit.) I, II; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	25	3	—	10	—	10	—	10	—	218 L. H.	Jones H. S. V.

SECOND SEMESTER

English 26 3 Schedule the same as for 25 (first semester).

8-9. Old English (Anglo-Saxon).—Grammar; short poems; *Beowulf*. (The first semester may be taken separately.) I, II; (3).

The English Language and Literature

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	8	3	—	11	—	11	—	11	—	110 L. H.
				Instructor Dodge						

SECOND SEMESTER										
English	9	3	Schedule the same as for 8 (first semester).							

27-28. Studies in the History of Journalism.—First semester: English literary periodicals and the periodical essay in the Eighteenth Century. Second semester: The magazine in America.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	27	2	—	—	2	—	2	—	—	218 L. H.
				Instructor Scott						

SECOND SEMESTER										
English	28	2	Schedule the same as for 27 (first semester).							

41-42. Teachers' Course.—Methods of teaching English literature and composition in the high school. (This course is not credited toward advanced degrees, or toward a major in English. Either semester may be taken separately.) *I, II; (2).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	41	2	—	—	3	—	3	—	—	110 L. H.
				Instructor Paul						

SECOND SEMESTER										
English	42	2	Schedule the same as for 41 (first semester).							

18. Modern English Grammar.—Sentence structure and analysis; grammatical categories; peculiarities of English syntax. *II; (3).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	18	3	—	11	—	11	—	11	—	218 L. H.
				Instructor Zeitlin						

35-36. The English Drama (Exclusive of Shakespeare).—35 (*first semester*): from the beginning to 1600. 36 (*second semester*): from 1600 to 1700. (Either semester may be taken for separate credit.) *I, II; (3).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	35	3	—	9	—	9	—	9	—	110 L. H.
				Instructor Dodge						

SECOND SEMESTER										
English	36	3	—	2	—	2	—	2	—	110 L. H.
				Sherman						

38. The Arthurian Tradition in England.—The historical Arthur. Celtic tales. Old French Romances (in translation). The tradition in England from the early romances to Arnold, with special attention to Malory and Tennyson. *II; (3).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	38	3	—	10	—	10	—	10	—	L. H.
				Schoepperle						

50. Celtic Literature in English Translation.—Irish, Scotch, Gaelic, and Welsh literatures, with special attention to the Cuchulainn and Ossianic cycles of romances and the Mabinogion. Celtic influence in English literature. *I; (2).*

The English Language and Literature

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	50	2	—	—	2	—	2	—	—	L. H.	Schoepperle

45. The Development of the Modern Drama.—Dramatic tendencies in the nineteenth century, both in England and on the Continent; representative readings, and lectures from the standpoint of comparative literature. *I; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	45	2	—	3	—	3	—	3	—	110 L. H.	Hillebrand

Courses for Graduates

101. Research in Special Periods.—Competent graduate students are encouraged to seek the advice and assistance of the department of English and to submit to the department plans for study in the language or literature of the periods mentioned below.

A. Anglo-Saxon language and literature Professor DODGE, Dr. ZEITLIN

B. Thirteenth and Fourteenth Centuries,
 Assistant Professor H. S. V. JONES

C. Sixteenth Century Professor DODGE

D. Seventeenth Century Assistant Professor BALDWIN

E. Eighteenth Century Professor SHERMAN, Assistant Professor PAUL

F. Nineteenth Century Professor SHERMAN, Associate Professor FULTON

106. English Literary Criticism From Dryden to Coleridge.— *Twice a week. I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	106	1 unit	—	—	10	—	10	—	—	218 L. H.	Fulton

110. Old English (Anglo-Saxon) Poetry.— *Twice a week. I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	110	1 unit	—					(Arrange)		110 L. H.	Dodge

114. The Development of the Essay.—An examination of the various types of the English essay with reference to Continental influences and classical origins. *I, II; (2).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	114	2	—	—	9	—	9	—	—	218 L. H.	Zeitlin

128. Spenser and the Beginnings of the English Renaissance.—Emphasis upon the persistence of certain medieval traditions reinforced by the Revival of Classical Learning. Consideration of Catholicism and Calvinism as sources of literary inspiration. *Twice a week. I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	128	1 unit	—	—	9	—	9	—	—	110 L. H.	Jones, H. S. V.

The English Language and Literature

136. The Transition From the Seventeenth to the Eighteenth Century: The Rise of Classicism.—*Twice a week. I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
English	136	1 unit	—	—	2	—	2	—	110 L. H.	Paul

138. The Romantic Movement in England.—*I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
English	138	1 unit	—	—	3	—	3	—	218 L. H.	Sherman

B. RHETORIC

Elementary Courses

***1-2. Rhetoric and Themes.**—Required for students in the Colleges of Liberal Arts and Sciences, Commerce, Engineering, and Agriculture. *I, II; (3).*

Prerequisite: The minimum entrance requirements in English.

NOTE: For the benefit of those whose course is irregular, a limited number of sections in each semester take up the work of the other semester. The course is not counted toward a major in English.

Students who show in the first two weeks that they are not prepared to do composition work of collegiate grade will be assigned to a special course parallel to Rhetoric 1, but involving additional work.

FIRST SEMESTER

(The following sections are open only to the students of the Colleges of Liberal Arts and Sciences, Commerce, and Law, the school of Music, and women students of the College of Agriculture).

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	A 1	8	—	8	—	8	—	419 U. H.	Cruzan
			A 2	8	—	8	—	8	—	314 U. H.	Hustvedt
			A 3	8	—	8	—	8	—	307 U. H.	—
			B 1	9	—	9	—	9	—	307 U. H.	Jones, H. S. V.
			B 2	9	—	9	—	9	—	318 U. H.	Curl
			B 3	9	—	9	—	9	—	314 U. H.	Gregory
			C 1	10	—	10	—	10	—	419 U. H.	Gregory
			C 2	10	—	10	—	10	—	315 U. H.	Scott
			C 3	10	—	10	—	10	—	314 U. H.	Downes
			D 1	11	—	11	—	11	—	420 U. H.	Creek
			D 2	11	—	11	—	11	—	419 U. H.	Downes
			D 3	11	—	11	—	11	—	314 U. H.	Whitford
			E 1	1	—	1	—	1	—	307 U. H.	Hillebrand
			F 1	2	—	2	—	2	—	419 U. H.	Boyer
			F 2	2	—	2	—	2	—	420 U. H.	Whicher
			G 1	3	—	3	—	3	—	307 U. H.	Fulton
			K 1	—	8	—	8	—	8	314 U. H.	Dixon
			L 1	—	9	—	9	—	9	307 U. H.	Cruzan
			M 1	—	10	—	10	—	10	302 U. H.	Rinaker

*Students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from the first semester's work. The examination for those desirous of meeting this qualification will be given at 7 p. m., September 20, in room 228 N. H.

The English Language and Literature

(The following sections are open only to Engineering students.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	A 4	8	—	8	—	8	—	208 P. L.	Sutcliffe
			B 4	9	—	9	—	9	—	204 T. B.	Sutcliffe
			B 5	9	—	9	—	9	—	215 T. B.	Tieje
			C 4	10	—	10	—	10	—	205 E. H.	Harbarger
			D 4	11	—	11	—	11	—	202 E. H.	Harbarger
			D 5	11	—	11	—	11	—	105 T. B.	Tieje
			E 4	1	—	1	—	1	—	202 E. H.	Stanley
			E 5	1	—	1	—	1	—	205 E. H.	Schultz
			F 4	2	—	2	—	2	—	202 E. H.	Whitford
			F 5	2	—	2	—	2	—	205 E. H.	Schultz
			G 4	3	—	3	—	3	—	202 E. H.	—
			K 4	—	8	—	8	—	8	205 E. H.	Schultz
			K 5	—	8	—	8	—	8	302 U. H.	Hustvedt
			K 6	—	8	—	8	—	8	214 U. H.	Thurber
			K 7	—	8	—	8	—	8	308 U. H.	—
			L 4	—	9	—	9	—	9	202 E. H.	Hustvedt
			M 4	—	10	—	10	—	10	308 E. H.	Alden
			N 4	—	11	—	11	—	11	202 E. H.	Alden

(The following sections are open only to men students in the College of Agriculture).

A 8	8	—	8	—	8	—	105 Law	Beck
A 9	8	—	8	—	8	—	315 U. H.	Harris
A10	8	—	8	—	8	—	420 U. H.	Jones, E. S.
A11	8	—	8	—	8	—	513 U. H.	Kelso
C 8	10	—	10	—	10	—	513 U. H.	Beck
C 9	10	—	10	—	10	—	420 U. H.	Kelso
C10	10	—	10	—	10	—	318 U. H.	—
C11	10	—	10	—	10	—	512 U. H.	Loomis
L 8	—	9	—	9	—	9	302 U. H.	Dixon
L 9	—	9	—	9	—	9	308 U. H.	Rinaker
L10	—	9	—	9	—	9	314 U. H.	Loomis
L11	—	9	—	9	—	9	419 U. H.	Gregory
L12	—	9	—	9	—	9	513 U. H.	Schoepperle

(Sections Z1 and Z2 below are for foreign students not versed sufficiently in English to pursue the course in regular sections. Assignments are to be made by permission of Professor F. W. Scott).

Z 1	9	—	9	—	9	—	420 U. H.	Creek
Z 3	3	—	3	—	3	—	419 U. H.	Downes

Sections 01 (8 M W F, 318 U. H., Harbarger), 02 (10 M W F, U. H., Stanley), 03 (9 T T S, 214 U. H., Tieje), and 04 (11 M W F, 302 U. H., Sutcliffe), are for students whose preparation proves after two weeks' trial in other sections to have been deficient. Assignments to these sections will be made by Professor F. W. Scott, and no student will be permitted to register in them on the registration days.

(The following sections of Rhetoric 2 (second semester Rhetoric) will be given during the first semester, and are open to students of all colleges who are irregular in course).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	B 1	9	—	9	—	9	—	308 U. H.	Harris
			C 1	10	—	10	—	10	—	214 U. H.	Harris
			D 1	11	—	11	—	11	—	308 U. H.	Kelso
			N 1	—	11	—	11	—	11	307 U. H.	Dixon

The English Language and Literature

SECOND SEMESTER

(The following sections are open only to students of the Colleges of Liberal Arts and Sciences, Commerce, and Law, the School of Music, and women students of the College of Agriculture).

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	A 1	8	—	8	—	8	—	419 U. H.	Cruzan
			A 2	8	—	8	—	8	—	314 U. H.	Hustvedt
			A 3	8	—	8	—	8	—	307 U. H.	—
			B 1	9	—	9	—	9	—	307 U. H.	Jones, H. S. V.
			B 2	9	—	9	—	9	—	318 U. H.	Curl
			B 3	9	—	9	—	9	—	314 U. H.	Gregory
			C 1	10	—	10	—	10	—	419 U. H.	Gregory
			C 2	10	—	10	—	10	—	314 U. H.	Scott
			C 3	10	—	10	—	10	—	315 U. H.	Downes
			D 1	11	—	11	—	11	—	420 U. H.	Creek
			D 2	11	—	11	—	11	—	307 U. H.	Downes
			D 3	11	—	11	—	11	—	314 U. H.	Whitford
			E 1	1	—	1	—	1	—	308 U. H.	Hillebrand
			F 1	2	—	2	—	2	—	419 U. H.	Boyer
			F 2	2	—	2	—	2	—	420 U. H.	Whicher
			G 1	3	—	3	—	3	—	308 U. H.	Fulton
			K 1	—	8	—	8	—	8	308 U. H.	Dixon
			L 1	—	9	—	9	—	9	307 U. H.	Cruzan
			M 1	—	10	—	10	—	10	302 U. H.	Rinaker

(The following sections are open only to engineering students).

A 4	8	—	8	—	8	—	208 P. L.	Sutcliffe
A 5	8	—	8	—	8	—	—	Thurber
B 4	9	—	9	—	9	—	205 E. H.	Sutcliffe
B 5	9	—	9	—	9	—	204 T. B.	Tieje
C 4	10	—	10	—	10	—	—	Harbarger
D 4	11	—	11	—	11	—	204 T. B.	Harbarger
E 4	1	—	1	—	1	—	202 E. H.	Stanley
E 5	1	—	1	—	1	—	308 E. H.	Schultz
F 4	2	—	2	—	2	—	202 E. H.	Whitford
F 5	2	—	2	—	2	—	308 E. H.	Schultz
G 4	3	—	3	—	3	—	202 E. H.	—
G 5	3	—	3	—	3	—	308 E. H.	Stanley
K 4	—	8	—	8	—	8	302 P. L.	Schultz
K 5	—	8	—	8	—	8	315 U. H.	Hustvedt
L 4	—	9	—	9	—	9	205 E. H.	Hustvedt
L 5	—	9	—	9	—	9	215 T. B.	Harbarger
M 4	—	10	—	10	—	10	208 P. L.	Alden
N 4	—	11	—	11	—	11	215 T. B.	Alden

(The following sections are open only to men students in the College of Agriculture).

A 8	8	—	8	—	8	—	418 U. H.	Beck
A 9	8	—	8	—	8	—	315 U. H.	Harris
A10	8	—	8	—	8	—	420 U. H.	Jones, E. S.
A11	8	—	8	—	8	—	513 U. H.	Kelso
C 8	10	—	10	—	10	—	513 U. H.	Beck
C 9	10	—	10	—	10	—	420 U. H.	Kelso
C10	10	—	10	—	10	—	318 U. H.	—
C11	10	—	10	—	10	—	512 U. H.	Loomis
L 8	—	9	—	9	—	9	302 U. H.	Dixon
L 9	—	9	—	9	—	9	308 U. H.	Rinaker
L10	—	9	—	9	—	9	314 U. H.	Loomis
L11	—	9	—	9	—	9	419 U. H.	Gregory
L12	—	9	—	9	—	9	513 U. H.	Schoepperle

The English Language and Literature

(Sections Z1 and Z2 below are for foreigners. Assignments are to be made by permission of Professor F. W. Scott).

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	Z 1	9	—	9	—	9	—	420 U. H.	Creek
			Z 2	3	—	3	—	3	—	420 U. H.	Downes

(The following sections of Rhetoric 1 (first semester Rhetoric) will be given during the second semester).

SECOND SEMESTER											
Rhetoric	1	3	B 1	9	—	9	—	9	—	214 U. H.	Harris
			C 1	10	—	10	—	10	—	418 U. H.	Harris
			D 1	11	—	11	—	11	—	318 U. H.	Kelso
			E 1	1	—	1	—	1	—	307 U. H.	Whitford
			K 1	—	8	—	8	—	8	419 U. H.	Sutcliffe
			L 1	—	9	—	9	—	9	420 U. H.	Tieje
			M 1	—	10	—	10	—	10	419 U. H.	Tieje
			N 1	—	11	—	11	—	11	308 U. H.	Dixon

Intermediate Courses

3. English Composition.—Short themes, with an occasional long theme. *I* or *II*; (3).

Prerequisite: Rhetoric 1-2.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Rhetoric	3	3	A	8	—	8	—	8	—	308 U. H.	Curl	
			C	10	—	10	—	10	—	308 U. H.	Alden	
				SECOND SEMESTER								
			A	8	—	8	—	8	—	308 U. H.	Curl	
			B	9	—	9	—	9	—	308 U. H.	Alden	
			C	10	—	10	—	10	—	308 U. H.	Jones	

6-7. Narrative Composition.—Practise in short story writing. (Intended for those who have some aptitude for literary work). *I, II*; (3).

Prerequisite: Two years of college work and the consent of the instructor.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	6	3	—	10	—	10	—	10	—	110 L. H.	Curl

SECOND SEMESTER											
Rhetoric	7	3	—	Schedule the same as for 6 (first semester).							

10. Business Writing.—Correspondence; sales letters; practise in writing business reports and summaries. Lectures and discussions. (Not counted toward a major in English). *I* or *II*; (2).

Prerequisite: Rhetoric 1-2.

NOTE: Sections A and B in the first semester, and A, B, and C in the second, are for the students in the College of Commerce and Business Administration.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	10	2	A	—	8	—	8	—	—	312 Com.	McJohnston
			B 1	—	9	—	9	—	—	312 Com.	McJohnston
			B 2	—	9	—	9	—	—	105 Law	Warnock
			C	—	10	—	10	—	—	315 U. H.	Stanley
			D	—	11	—	11	—	—	302 U. H.	Thurber

The English Language and Literature

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	10	2	A	—	8	—	8	—	—	312 Com.	McJohnston
			B 1	—	9	—	9	—	—	312 Com.	McJohnston
			B 2	—	9	—	9	—	—	105 Law	Warnock
			C 1	—	10	—	10	—	—	312 Com.	McJohnston
			C 2	—	10	—	10	—	—	315 U. H.	Stanley
			D 1	—	11	—	11	—	—	307 U. H.	Thurber

12. The Collecting and Writing of News.—Drill in gathering news, with exercises and assignments in writing the news-story; the various types of newspaper narratives; news values are considered with the aid of representative newspapers on file in the laboratory. *I*; (3).

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	12	3	—	8	—	9	—	9	—	105 Law	Harrington

13. The Newspaper.—A continuation of Rhetoric 12, with the addition of interviewing and newspaper correspondence; the organization and mechanical details of the newspaper. Practise in writing for newspapers. *Six laboratory periods and three lectures a week. II*; (3).

Prerequisite: Rhetoric 1-2, 12.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	13	3	—	9	—	9	—	9	—	105 Law	Harrington

22. Summarizing and Briefing.—Summarizing, briefing, and making reports; abstracts of correspondence on file; summarizing of commercial and economic data for the solution of business problems. (For students in the College of Commerce and Business Administration). *I*; (2).

Prerequisite: Rhetoric 10.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	22	2	—	—	10	—	10	—	—	312 Com.	McJohnston

25-26. Senior Conferences (Courses in Commerce and Business Administration).—Each senior is required to present all papers written during the year for review and criticism. Rewriting may be required if they are open to serious criticism. (Required of all seniors in the College of Commerce and Business Administration). *I, II*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	25	1	—	—	—	—	11	—	—	312 Com.	McJohnston

SECOND SEMESTER

Rhetoric	26	1	—	Schedule the same as for 25 (first semester).							
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19. Agricultural News Writing.—Class exercises; lectures; assignments in gathering and preparing material for agricultural papers. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	19	3	—	—	3	—	3	—	—	302 U. H.	Scott

The English Language and Literature

Courses for Advanced Undergraduates and Graduates

15-16. Editorials and Special Articles.—Sources and treatment of material for editorials and articles; the interpretation of news; journalistic backgrounds; the relation of current events to the social sciences. Assigned readings, preparation of editorials, articles, and reviews. *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	15	3	—	2	—	2	—	2	—	105 Law	Scott

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	16	3		Schedule the same as for 15 (first semester).							

17. Advanced Composition.—Emphasis on the study of structure; criticism of current periodical literature; the developing of material for reports, magazine articles, etc. (Open to a limited number of students, and only on recommendation). *II; (3).*

Prerequisite: Two years of college work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	17	3	—	10	—	10	—	10	—	L. H.	—

26-27. Editorial Practise.—Practical training in the reading of "copy", writing of headlines, making up, editorial supervision, proof reading, and type selection. *Five hours' work on the desk and one lecture a week. I, II; (3).*

Prerequisite: Rhetoric 12, 13, or the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	26	3	—				(Arrange)			103 Law	Harrington

SECOND SEMESTER

Rhetoric	27	3		Schedule the same as for 26 (first semester).							
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29. Making a Country Newspaper.—Discussions intended primarily for seniors who expect to enter the country field. A study of small town conditions; problems affecting rural newsgathering; country correspondence; circulation; advertising; business efficiency; print-shop equipment. Special investigations by members of the class.

Prerequisite: Junior or senior standing. *II; (2).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	29	2	—	—	10	—	10	—	—	105 Law	Harrington

C. PUBLIC SPEAKING

1. Oral Expression.—Theory and practise of elocution and expression, both for public and private address. *I; (2).*

Prerequisite: Rhetoric 1-2.

The English Language and Literature

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	1	2	A	1	—	1	—	—	—	418 U. H.	Woolbert
			B	—	1	—	1	—	—	318 U. H.	Sarett
			C	1	—	1	—	—	—	419 U. H.	Phelps
			D	2	—	2	—	—	—	318 U. H.	Phelps
			E	—	1	—	1	—	—	419 U. H.	Phelps
			F	—	2	—	2	—	—	318 U. H.	Phelps
			G	3	—	3	—	—	—	318 U. H.	Woolbert
			H	—	3	—	3	—	—	318 U. H.	Phelps

2. Extemporaneous Speaking.—Discussion of topics of current interest, assigned and chosen; adaption of speaking manner to subject matter, length, and attendant circumstances of the address; cultivation of facility in thinking on the platform. *II*; (2).

Prerequisite: Public Speaking 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	2	2	A	1	—	1	—	—	—	418 U. H.	Woolbert
			B	—	1	—	1	—	—	318 U. H.	Sarett
			C	1	—	1	—	—	—	419 U. H.	Phelps
			D	2	—	2	—	—	—	418 U. H.	Phelps
			E	—	1	—	1	—	—	419 U. H.	Phelps
			F	—	2	—	2	—	—	318 U. H.	Phelps

3. Argumentation.—Theory of argumentative discourse, aimed to cultivate ability in meeting the contentions of an opponent; briefing, speech-writing, criticism of the literature of debate; text and exercises. *I*; (3).

Prerequisite: Public Speaking 1 and 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	3	3	A	2	—	2	—	2	—	418 U. H.	Sarett
			B	3	—	3	—	3	—	418 U. H.	Sarett

4. Debate.—Application of the principles of argumentation to the spoken debate; team and individual competition; debates on current issues. *II*; (3).

Prerequisite: Public Speaking 3.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	4	3	A	2	—	2	—	2	—	318 U. H.	Sarett
			B	3	—	3	—	3	—	318 U. H.	Sarett

5. Persuasion.—The winning of individuals and audiences by means of written and spoken appeal; primarily a study in matter, with secondary attention to appropriate platform manner and methods. *I*; (2).

Prerequisite: Public Speaking 1 and 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	5	2	A	2	—	2	—	—	—	320 U. H.	Woolbert
			B	—	2	—	2	—	—	320 U. H.	Woolbert

6. The Forms of Public Address.—Types and modes of speeches; speech style, criticism, and a study of standards; practise in using various forms. *II*; (2).

Prerequisite: Public Speaking 1 and 2.

Entomology

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	6	2	A	—	2	—	2	—	—	320 U. H.	Woolbert

7. A Study of Orators and Oratory.—The lives, times, and works of distinguished speakers; required readings and reports, chiefly oral in the form of speeches; discussions, topical speeches, and declamations. *I*; (2).

Prerequisite: Public Speaking 1 and 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	7	2	—	—	3	—	3	—	—	320 U. H.	Woolbert

10. Interpretation and Dramatization of Literature.—Oral interpretation of standard literature; the interpretation and staging of plays. *II*; (2).

Prerequisite: Public Speaking 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	10	2	G	3	—	3	—	—	—	320 U. H.	Woolbert
			H	—	3	—	3	—	—	320 U. H.	Phelps

ENTOMOLOGY

(See also BOTANY, PHYSIOLOGY, and ZOOLOGY.)

STEPHEN ALFRED FORBES, Ph.D., LL.D., *Professor*
 ALEXANDER DYER MACGILLIVRAY, Ph.D., *Associate Professor*
 JUSTUS WATSON FOLSOM, D.Sc., *Assistant Professor*
 ROBERT DOUGLAS GLASGOW, Ph.D., *Instructor*
 EDNA MOSHER, Ph.D., *Instructor*
 CLYDE CARNEY HAMILTON, B.S., *Graduate Assistant*

Major: 20 hours from courses offered in the department, except Entomology 1, 4, and 16.

Minors: 20 hours in botany, physiology, zoology; horticulture and agronomy (see page 25).

Entomology as taught at the University is distinctly differentiated from the work in zoology. Beginning courses open to freshmen and without prerequisites are 1a-1b, 15, and 4. Course 1a-1b may be followed by 2 or 3, and course 15 by 7. Course 3 is not open to freshmen, and courses 5 and 13 are not open to freshmen or sophomores. Students preparing for service as economic entomologists should take as many of the courses offered as possible, including especially 2, 3, 4, 7, 8a-8b, 14, and 108. Those preparing for the teaching of zoology should take either 2 and 4, or 3 and 4, or all three of these courses.

1a-1b. Elementary Entomology.—Lectures; laboratory; field work. (Open to all students.) *I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	1a	2	A	1,2	—	1,2	—	—	—	N. H.	Folsom
			B	—	1,2	—	1,2	—	—	N. H.	Glasgow

SECOND SEMESTER

Entomology	1b	2	—	Schedule the same as for 1a (first semester).							
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Entomology

2. General Entomology.—Field entomology; morphological and physiological entomology; the collection and preservation of specimens; laboratory studies of typical insects; the recognition of adaptive structures and their utilities. (This course, taken with entomology 3, forms a year's work, covering the whole field, but either may be taken separately.) *I*; (5).

Prerequisite: Entomology, 1a-1b, or 4, or equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	2	5	—	10,11	10,11	10,11	10,11	10,11	—	405 N. H.
										Instructor Folsom Glasgow

3. General Entomology.—Classification and determination of insects; study of life histories in the insectary and by field observation; collection of information on the ecological relations of insects. *II*; (5).

Prerequisite: Entomology, 1a-1b, or 4, or equivalent.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	3	5	—	10,11	10,11	10,11	10,11	10,11	—	405 N. H.
										Instructor Folsom Glasgow

4. Introduction to Economic Entomology.—Lectures; field work; laboratory. Primarily for students in the College of Agriculture; it may not be counted for satisfaction of group requirements in the College of Liberal Arts and Sciences. *I* or *II*; (3).

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	4	3	A	8,9	—	8,9	—	8,9	—	— N. H.
										Folsom
			B	9,10	—	9,10	—	9,10	—	— N. H.
										Glasgow

5. Introduction to Research.—Preparation for thesis work. Library, language, manuscript, and advanced laboratory work on assigned topics. Three hours in this course are required as a preparation for entomological thesis work. *I* or *II*; *(3 to 5). *Time to be arranged.*

Associate Professor MACGILLIVRAY, Assistant Professor FOLSOM

Prerequisite: Entomology 2, 3; or 15, 7.

6a-6b. Thesis Investigation.—Subjects selected during the junior year. Three hours a day given to investigation, under the supervision of an instructor during the senior year. *I, II*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY, Assistant Professor FOLSOM

7. Systematic Entomology.—The external anatomy of insects; terminology of the parts; identification of specimens representing as many as possible of the major groups. *I* or *II*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2, or 15.

8a-8b. Advanced Economic Entomology.—Assigned problems. Field laboratory, insectary, library, and manuscript work, with practise in the opera-

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

tions of economic entomology. (Intended to prepare students for service as entomologists in experiment stations and other state and government positions. Agronomy 7 and Horticulture, 1, 2, and 3 should also be taken as a part of this preparation.) *I, II; (3).*

Prerequisite: Entomology 4, 2, 3.

				FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Entomology	8a	3	—	1,2	—	1,2	—	1,2	—	405 N. H.	Folsom Glasgow	

SECOND SEMESTER										
Entomology	8b	3	—	Schedule the same as for 8a (first semester).						

9. Advanced Systematic Entomology.—The identification of the characters upon which genera and species are based. *I or II; (5).* *Time to be arranged.*
Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2 or 15, and 7.

10. Taxonomy of Immature Insects.—*I; (5).* *Time to be arranged.*
Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2 or 15, and 7.

11. Classification of the Coccidæ.—Methods of preparing scale insects for study, the identification of genera and species, and discussion of their morphology, metamorphosis, and phylogeny. *II; (5).* *Time to be arranged.*

Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2 or 15, and 7.

12a-12b. Current Literature.—Reports and discussion upon assigned topics; presentation and discussion of contents of recent entomological publications, and of results of personal research. *I, II; (1).*

Prerequisite: One year of entomological work.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	12a	1	—	4	—	—	—	—	—	405 N. H.	—

SECOND SEMESTER										
Entomology	12b	1	—	Schedule the same as for 12a (firs. semester).						

13. Medical Entomology.—Insects and the transmission of disease; methods of control and prevention. (Primarily for advanced students preparing for medicine.) *II; (3).*

Prerequisite: Zoology 3, or its equivalent in microscopical technique.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	13	3	—	9	—	9	—	9	—	— N. H.	Glasgow

(Arrange three additional hours.)

14. Advanced Economic Entomology.—Personal work under direction on assigned problems in economic entomology, to prepare advanced students for immediate service as state and government entomologists. Advantage will be taken of the operations and practical problems of the State Entomologist's

Entomology

office so far as available. *I, II, and six weeks in the summer; *(2 to 4). Time to be arranged.* Professor FORBES, Assistant Professor FOLSOM

Prerequisite: Courses in elementary and advanced economic entomology and in systematic entomology and the consent of the instructor.

15. Elementary Systematic Entomology.—Characteristics of the orders, suborders, and more important families, illustration by descriptions of the habits of representative species; field collections and laboratory studies on the anatomy and classification of insects. *I; (3).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	15	3	—	10	—	10	—	10	—	229 N.H. MacGillivray

(Arrange time for laboratory.)

16. Apiculture.—The essentials of bee-keeping. Practical operations, laboratory observations, and collateral reading. *II; (2).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	16	2	—	—	1,2	—	1,2	—	—	Insectary

Folsom

Courses for Graduates

The prerequisite for graduate work in entomology is one year's work in biological courses, including an equivalent of either Zoology 1 or Entomology 1a-1b, or 4. Entrance upon major work in entomology requires the equivalent of Entomology 2 and 3.

Graduate students who have had at least one year of college work in biological courses may take for graduate credit any of the preceding courses except 1a-1b, 4, and 6a-6b. The following courses are open to graduate students only.

102. Research in the Morphology and Embryology of Insects.—*Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Assistant Professor FOLSOM

107. Systematic Entomology.—*Five times a week; I, II; (1 or 2 units). Time to be arranged.*

Associate Professor MACGILLIVRAY

108. Research in Economic Entomology.—*Once or twice a week; I, II; (1 or 2 units). Time to be arranged.*

Assistant Professor FOLSOM

109. Research in Systematic Entomology.—*Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Associate Professor MACGILLIVRAY

FINE ARTS

(See ART AND DESIGN and MUSIC. Attention is called also to the courses in ESTHETICS offered by the departments of PHILOSOPHY, EDUCATION, ARCHITECTURE, and HOUSEHOLD SCIENCE.)

FLORICULTURE.

(See HORTICULTURE.)

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FRENCH

(See ROMANCE LANGUAGES AND LITERATURE.)

GEOLOGY

(Including MINERALOGY, PALEONTOLOGY, and PHYSICAL GEOGRAPHY)

CHARLES WESLEY ROLFE, M.S., *Professor*
 WILLIAM SHIRLEY BAYLEY, Ph.D., *Professor*
 THOMAS EDMUND SAVAGE, Ph.D., *Associate Professor*
 JOHN LYON RICH, Ph.D., *Instructor*
 FRANCIS MARION VAN TUYL, Ph.D., *Instructor*
 CLARENCE SAMUEL ROSS, A.M., *Assistant*
 HENRY METHUSALEM DUBOIS, A.M., *Assistant*
 MASON KENT READ, A.B., *Assistant*
 LUTHER EUGENE KENNEDY, A.M., *Assistant*

Major: 20 hours in any one of the following fields, including Geology 1a, and excluding Geology 3, 14, and 22. In addition to Geology 1a, the major in (a) general geology, must also include Geology 15 and 24; in (b) stratigraphy and paleontology, Geology 16; in (c) mineralogy and economic geology, Geology 2 and 6; in (d) geography, Geology 24, and at least one of the courses, Geology 8, 10 and 11.

Minors: 20 hours selected from courses in chemistry, zoology, botany, physics, and economics.

Courses for Undergraduates

1. Dynamic and Structural Geology.—The agents and processes involved in the development of the earth's present features. Lectures; laboratory; field trips. *I*; (5).

Prerequisite: Chemistry 1 or an equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	1	5	—	8,9	8,9	8,9	8,9	8,9	—	249 N. H.	Rolfe Kennedy

(Occasional trips on Saturday.)

1a. Historical Geology.—The evolution of the earth and its life. Lectures; laboratory work, consisting largely of a study of the more characteristic fossils from the various horizons. (Continuing course 1 and introducing courses 9 and 16.) *II*; (5).

Prerequisite: Geology 1 or 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	1a	5	—	8,9	8,9	8,9	8,9	8,9	—	249 N. H.	Savage Van Tuyl DuBois

2. Economic Geology.—The origin and manner of occurrence of minerals and rocks of economic importance, especially those of North America. Lectures; laboratory. *II*; (3).

Prerequisite: Geology 5; 13a and 13b, or 1 and 1a.

Geology

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	2	3	—	3	—	3	—	3	—	247 N. H.	Van Tuyl

3. General Geology.—Mineralogy; dynamic, historic, and economic geology; minerals; rocks; contour maps; fossils. Recitations; laboratory; field trips. (For students who wish to devote but one semester to geology.) *I* or *II*;
(5). *Daily, with occasional trips on Saturday.*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	3	5	—	10,11	10,11	10,11	10,11	10,11	—	249 N. H.	Rolfe Read Kennedy

SECOND SEMESTER

8,9	8,9	8,9	8,9	8,9	—	247 N. H.	Rolfe Read Kennedy
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5. Mineralogy.—The most common ores and minerals of scientific importance; crystallography; the characteristics of about 125 of the most important minerals; blow pipe analysis. Lectures; laboratory. *I*; (5).

Prerequisite: Chemistry, 1, 2, 3, or 2a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	5	5	—	8,9	8,9	8,9	8,9	8,9	—	247 N. H.	Bayley Ross

5a. Mineralogy.—The characteristics, origin, and transformations of the silicates. Lectures and laboratory. *II*; (3).

Prerequisite: Geology 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	5a	3	—	(Arrange)						134 N. H.	Van Tuyl Ross

8. Physiography of Europe.—Explanatory treatment of the physiographic features of the continent of Europe; climate; resources; the influence of geographic factors on industries, distribution of population, etc. *II*; (3).

Prerequisite: Geology 23 and 14.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	8	3	—	1,2	—	1,2	—	1,2	—	247 N. H.	Rich

10. Physiography of South and Central America.—A regional study; physiography; climate; resources. *II*; (3).

Prerequisite: Geology 23 and 14.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	10	3	—	10,11	—	10,11	—	10,11	—	252 N. H.	Rich

11. Physiography of North America.—Typical physiographic provinces of North America, with especial emphasis on the United States. Lectures, readings, and maps. *I*; (3).

Prerequisite: Geology 23 and 14.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	11	3	—	10,11	—	10,11	—	10,11	—	252 N. H.	Rich

12. Geology of Soils.—The origin of the various classes of soils; mineral compositions; physical characteristics; transformations. (Valuable to students of agriculture and others interested in plant growth.) *II*; (5).

Prerequisite: Chemistry 1 or an equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	12	5	—	1,2	1,2	1,2	1,2	1,2	—	247 N. H.	Rolfe Kennedy

(Occasional trips on Saturday.)

13a. Engineering Geology.—Mineralogy and lithology. Open only to students in engineering and ceramics. Lectures; laboratory. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13a	3	—	10,11	—	10,11	—	10,11	—	247 N. H.	Van Tuyl Ross

13b. Engineering Geology.—Dynamic and structural geology. Open only to students in engineering and ceramics. Lectures; laboratory. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13b	3	—	10,11	—	10,11	—	10,11	—	247 N. H.	Bayley Ross

14. Meteorology.—The heating and cooling, pressure, circulation, and moisture of the atmosphere; storms and weather forecasting; rainfall, climate. (To be taken by those who intend to do work in geography and agriculture; should be taken with Economics 26 by students of commerce.) *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	14	3	—	1,2	—	1,2	—	1,2	—	249 N. H.	Rich Read

19. Field Geology.—(Introductory Course). The physiography and geology of a selected area, including the making of a map of the area and the submission of a satisfactory written discussion of its geology. *Four weeks in the early summer*; (3). *Time to be arranged.* Dr. VAN TUYL

Prerequisite: Geology 1 and 1a; 13a and 13b or 3 and 23.

19a. Field Geology.—Excursion to Central Kentucky and Mammoth Cave; valley trains of Wabash River; glacial border; Bedford limestone quarries; Falls of the Ohio at Louisville; the Louisville cuesta; Mitchell limestone plateau; Mammoth Cave. The trip involves an absence from the University of one week at the time of the Easter recess. Cost about \$30.00. Credit on completion of satisfactory report. *II*; (1).

Dr. RICH or Associate Professor SAVAGE

Prerequisite: Geology 1, 3, or 13b.

21. Geology of Coal.—The origin of coal; age, distribution, and stratigraphy of the coal deposits of North America, with special emphasis on the Illinois or Eastern Interior basin. *I*; (2).

Prerequisite: Geology 13b or an equivalent.

Geology

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	21	2	—							254 N. H.	Van Tuyl

(Arrange)

[22. Organic Evolution.—The evolution of plant and animal forms as indicated by the fossil record. *II*; (3). Not given in 1915-16.

Prerequisite: Geology 1a, or one semester of zoology or botany.]

23. Physiography of the Lands.—A systematic study of land forms; origin, development, and classification; the relation between surface forms and rock composition and structure; the influence of climate on land forms. This course follows Geology 3 and presupposes a knowledge of the principal geologic processes. Five all day field excursions. *II*; (5).

Prerequisite: Geology 3 or 13a and 13b or 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	23	5	—	8,9	8,9	8,9	8,9	8,9	—	252 N. H.	Rich Read

Courses for Advanced Undergraduates and Graduates

6. Geometrical and Optical Crystallography.—Introduction to petrography. The geometrical and optical properties of minerals with reference to symmetry. Polarized light and its practical use in identifying the rock-forming materials. *I*; (3).

Prerequisite: Geology 5, 5a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	6	3	—							134 N. H.	Bayley

(Arrange)

7. Petrography.—The principles learned in geology 6 applied to the study of rocks. Lectures on the different types of rocks and their origin and classification. In the laboratory a representative suite of specimens is studied in the hand specimen and thin section. *II*; (3).

Prerequisite: Geology 6.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	7	3	—							134 N. H.	Bayley

(Arrange)

9. Paleontology.—Invertebrate fossils, their classification and relationships. The identification of the fossils, and the finding and use of the literature of the subject. *I*; (5).

Prerequisite: Geology 1a; or senior standing in zoology or botany.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	9	5	—	8,9	8,9	8,9	8,9	8,9	—	254 N. H.	Savage Van Tuyl

15. Structural Geology.—The arrangement of the rocks which form the earth's crust and their distribution on its surface; mountains; faults; folds; other diastrophic phenomena. *I*; (3).

Prerequisite: Geology 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	15	3	—	2	—	2	—	2	—	247 N. H.	Van Tuyl

16. Stratigraphy.—Principles of classification of rock formations, and of the methods and criteria employed in correlation of the successive geologic formations. *II*; (5).

Prerequisite: Geology 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	16	5	—	1,2	1,2	1,2	1,2	1,2	—	249 N. H.	Savage Van Tuyl DuBois

17. Principles of Stratigraphy.—Sedimentary rocks and associated deposits; kinds; composition; origin; mode of occurrence; geologic interpretation. *I*; (5).

Prerequisite: Geology 16.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	17	5	—					(Arrange)		249 N. H.	Savage DuBois

24. Physiographic Interpretations.—The application of physiographic principles to the interpretation of recent earth history; erosion planes and their meaning; drainage modifications; physiographic indications of climatic fluctuations. This course naturally follows Geology 23, but requires in addition a knowledge of stratigraphic geology. *I*; (3).

Prerequisite: Geology 23 and 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	24	3	—	8,9	—	8,9	—	8,9	—	252 N. H.	Rich

25. Physiography of the Mississippi Valley.—An intensive study and interpretation of the physiography of the Mississippi Valley, with field trips to southern Illinois, eastern Missouri, the Baraboo Ridges of Wisconsin, or the Lexington dome of Kentucky. *II*; (3). *Time to be arranged.* Dr. Rich

Prerequisite: Geology 24 or an equivalent, and senior or graduate standing.

Surveying for Students in Geology.—(See Civil Engineering 33 and 34.)

Courses for Graduates

The first prerequisite for graduate work in Geology is the equivalent of the complete undergraduate offerings in that branch of the subject in which specialization is desired. Those specializing in paleontology should have, in addition, at least an elementary knowledge of systematic zoology; those specializing in physical geography should have a knowledge of general physics and chemistry; and those who expect to pursue work in petrography and economic geology should be well grounded in general physics, inorganic chemistry, and the elements of physical chemistry. All graduate students should be able to read the journals printed in German and French.

Germanic Languages and Literature

101. Advanced Crystallography.—This course is intended to familiarize the student in chemistry or mineralogy with the methods used in measuring, projecting, and calculating crystal forms, and determining the physical properties of crystalized bodies. *Three to five times a week; I, II; (1 unit). Time to be arranged.* Professor BAYLEY

[102. Petrography.—Lectures and laboratory work on the igneous and fragmental rocks; including identification of types, classification and relationships. *Twice a week; I, II; (1 unit). Not given in 1915-16.]*

103. The Crystalline Schists and Other Metamorphic Rocks.—Processes of Metamorphism. Lectures; laboratory. *Twice a week; I, II; (1 unit). Time to be arranged.* Professor BAYLEY

105. Invertebrate Paleontology.—Devoted to the study of a group of invertebrate fossils, or of the fossils of a special geological system; their geographic distribution and geologic range with reference to stratigraphy. Largely individual work. *One to three times a week; I, II; (1 unit). Time to be arranged.* Associate Professor SAVAGE

106. Areal and Stratigraphic Geology.—A systematic study of the geology and paleontology of a selected area in Illinois, and a report on the geology of the region, based on the data collected in the field. *One to three times a week; I, II; (1 to 2 units). Time to be arranged.*

Associate Professor SAVAGE

[107. Areal and Structural Geology.—Individual work on some area exhibiting important structural or economic features. *Once a week; I, II; (2 units). Omitted in 1915-16.]*

108. Advanced Economic Geology.—The processes resulting in the production of ore-bodies. Studies of type mining districts. *Three times a week; I, II; (1 to 2 units). Time to be arranged.* Professor BAYLEY

124. Advanced Physiography.—Individual work on field problems; study and discussion of the literature of physiography and geomorphology. *One to three times a week; I, II; (1 unit). Time to be arranged.* Dr. RICH

GERMANIC LANGUAGES AND LITERATURE

(Including SCANDINAVIAN)

JULIUS GOEBEL, Ph.D., *Professor*

OTTO EDUARD LESSING, Ph.D., *Professor*

GEORGE TOBIAS FLOM, Ph.D., *Associate Professor, Scandinavian*

NEIL CONWELL BROOKS, Ph.D., *Assistant Professor*

LEONARD BLOOMFIELD, Ph.D., *Assistant Professor, Comparative Philology*

JOSEPH C. GILLET, Ph.D., *Associate in German and Comparative Literature*

DAISY LUANA BLAISDELL, A.M., *Instructor*

CHARLES ALLYN WILLIAMS, Ph.D., *Instructor*

ARMIN HAJMAN KOLLER, Ph.D., *Instructor*

ALEXANDER GREEN, Ph.D., *Instructor*

HUGH WILEY PUCKETT, Ph.D., *Instructor*

HEINRICH WALDEMAR NORDMEYER, Ph.D., *Instructor*

EARL KILBURN KLINE, A.M., *Instructor*

Germanic Languages and Literature

GERMAN

Major: 20 hours in German, excluding German 1, 2, and 3, and including at least 6 hours of primarily fourth-year courses.

Minors: 20 hours in not more than two subjects chosen from the following list: languages, education, history, philosophy, and psychology, provided that 8 hours must be selected from a language other than German.

GERMANIC LANGUAGES

Major: 20 hours in German and the Scandinavian languages, provided that at least 8 hours must be in German and 8 hours in one Scandinavian language. Only German courses above the second year, and Scandinavian courses exclusive of Scandinavian 6 and 12 will be acceptable.

Minors: 20 hours in not more than two subjects chosen from the following list: languages, education, history, philosophy, and psychology.

A. GERMAN

First-Year Courses

1. Elementary Course.—Grammar and easy reading for beginners. (Two sections are offered in the second semester for students who enter the University in the second semester.) *I*; (4).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>		
German	1	4	A	—	8	8	8	8	—	312 U. H.	Bloomfield
			B	—	9	9	9	9	—	212 U. H.	Brooks
			C	—	10	10	10	10	—	310 U. H.	Nordmeyer
			D	—	11	11	11	11	—	213 U. H.	Gillet
			E	1	1	1	1	—	—	312 U. H.	Puckett
			F	2	2	2	2	—	—	310 U. H.	Blaisdell
			G	3	3	3	3	—	—	312 U. H.	Koller
			(For Students in Engineering)								
			H	—	8	8	8	8	—	311 U. H.	Kline
			I	2	2	2	2	—	—	213 U. H.	Green

SECOND SEMESTER

A	—	8	8	8	8	—	213 U. H.	Blaisdell
B	—	9	9	9	9	—	213 U. H.	Kline

2. Narrative Prose.—Grammar and reading. *I*; (4).

Prerequisite: One year of high school German or German S 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>		
German	2	4	A	—	8	8	8	8	—	213 U. H.	Nordmeyer
			B	—	11	11	11	11	—	213 U. H.	—
			C	2	2	2	2	—	—	311 U. H.	Puckett
			D	3	3	3	3	—	—	212 U. H.	—

3. Narrative Prose.—Grammar and reading. (Continuation of German 1.) *II*; (4).

Prerequisite: German 1.

Germanic Languages and Literature

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	3	4	A	—	8	8	8	8	—	312 U. H.	Bloomfield
			B	—	9	9	9	9	—	212 U. H.	Brooks
			C	—	10	10	10	10	—	310 U. H.	Nordmeyer
			D	—	11	11	11	11	—	213 U. H.	Gillet
			E	1	1	1	1	—	—	312 U. H.	Puckett
			G	3	3	3	3	—	—	312 U. H.	Koller
			(For Students in Engineering)								
			H	—	8	8	8	8	—	311 U. H.	Kline
			I	2	2	2	2	—	—	310 U. H.	Green

Second-Year Courses

4. Prose Reading.—Selections from standard prose writers; sight reading; composition. *I* or *II*; (4.)

Prerequisite: German 2, or 3, or two years of high school German.

FIRST SEMESTER

NOTE.—Sections E and H are *honor sections* to which students are admitted only by special permission from the department.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	4	4	A	—	8	8	8	8	—	310 U. H.	Puckett
			B	—	9	9	9	9	—	213 U. H.	Blaisdell
			C	—	10	10	10	10	—	311 U. H.	Gillet
			D	—	10	10	10	10	—	213 U. H.	Green
			*E	—	11	11	11	11	—	312 U. H.	Blaisdell
			F	—	11	11	11	11	—	212 U. H.	Kline
			G	1	1	1	1	—	—	310 U. H.	Williams
			*H	2	2	2	2	—	—	312 U. H.	Koller
			I	2	2	2	2	—	—	212 U. H.	Kline
			J	3	3	3	3	—	—	213 U. H.	Green

SECOND SEMESTER

A	—	8	8	8	8	—	310 U. H.	Nordmeyer
B	—	11	11	11	11	—	311 U. H.	—
C	2	2	2	2	—	—	212 U. H.	Puckett
D	3	3	3	3	—	—	212 U. H.	—

5. Narrative and Historical Prose.—At the option of the instructor one classic in verse may also be read. Composition. *I* or *II*; (4.)

Prerequisite: German 4, or three years of high school German.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	5	4	A	—	10	10	10	10	—	212 U. H.	Williams
			B	—	11	11	11	11	—	311 U. H.	Williams
			C	—	11	11	11	11	—	205 L. H.	Koller

SECOND SEMESTER

NOTE.—Section E is an *honor section* to which students are admitted only by special permission from the department.

B	—	9	9	9	9	—	311 U. H.	Blaisdell
C	—	10	10	10	10	—	213 U. H.	Gillet
*E	—	11	11	11	11	—	312 U. H.	Blaisdell
G	1	1	1	1	—	—	311 U. H.	Williams
H	2	2	2	2	—	—	312 U. H.	Koller

*Honor section to which students are admitted only by special permission from the department.

Germanic Languages and Literature

6. Scientific Prose.—The rapid reading of works of a general scientific character. (Parallel with 5. Students may not take both 5 and 6 for more than a total of four hours' credit without special permission of department.) *II*; (4).

Prerequisite: German 4, or three years of high school German.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	6	4	A	—	8	8	8	8	—	— U. H.	Puckett
			F	—	11	11	11	11	—	212 U. H.	Kline
			I	2	2	2	2	—	—	213 U. H.	Nordmeyer

12. Newspaper Reading.—Daily reading of newspapers. Oral and written composition based upon the reading. Conversation. (Parallel with 5 and 6. Not open to students who have had 5 or 6 or any more advanced course.) *II*; (4).

Prerequisite: German 4, or three years of high school German, and the consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	12	4	—	—	10	10	10	10	—	312 U. H.	Green

Third-Year Courses

7. Modern Fiction.—(Intended primarily for students who take 5 in the first semester. Not open to those who have had any course more advanced than 5.) *II*; (3).

Prerequisite: German 5, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	7	3	A	10	—	10	—	10	—	311 U. H.	Williams
			B	11	—	11	—	11	—	205 L. H.	Nordmeyer

10. Introductory Goethe Course.—Reading of works illustrating different periods in Goethe's development: *Götz von Berlichingen*; *Egmont*; *Iphigenie auf Tauris*; selections from *Dichtung und Wahrheit*. *II*; (3).

Prerequisite: German 14, or 16, or 24, or 28a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	10	3	A	10	—	10	—	10	—	212 U. H.	Brooks
			B	11	—	11	—	11	—	310 U. H.	Williams

14. Introductory Schiller Course.—Works illustrating different periods in Schiller's development: Lyrics and Ballads; *Kabale und Liebe*; *Braut von Messina*. *I*; (3).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	14	3	A	10	—	10	—	10	—	312 U. H.	Blaisdell
			B	2	—	2	—	2	—	205 L. H.	Lessing

16. Elementary Composition and Conversation.—*I* or *II*; (2).

Prerequisite: German 5, or equivalent.

Germanic Languages and Literature

			FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
German	16	2	A	—	9	—	9	—	—	312 U. H.	Bloomfield	
			B	—	2	—	2	—	—	215 L. H.	Williams	
			SECOND SEMESTER									
			—	—	2	—	2	—	—	311 U. H.	Kline	

17. Intermediate Composition and Conversation.—I or II; (3).

Prerequisite: German 16.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	17	3	—	9	—	9	—	9	—	312 U. H.	Green
SECOND SEMESTER											
			A	9	—	9	—	9	—	312 U. H.	Bloomfield
			B	2	—	2	—	2	—	311 U. H.	Williams

24. Modern Drama.—Rapid reading of dramas by Grillparzer, Hebbel, Hauptmann, and others. I; (3).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
German	24	3	—	9	—	9	—	9	—	311 U. H.	Nordmeyer

28a-28b. German Lyrics.—The form, development, and different types of the lyric. (First semester): The chief lyric poets of the classical period. (Second semester): The chief lyric poets of the nineteenth century. (The first semester may be taken separately, but not the second without the first). I, II; (2).

Prerequisite: German 5, or equivalent, and sophomore standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	28a	2	—	—	11	—	11	—	—	310 J. H.	Puckett
SECOND SEMESTER											
German	28b	2	—	Schedule the same as for 28a (first semester).							

Primarily Fourth-Year Courses

NOTE.—For a major in German students are required to take at least six hours of these primarily fourth-year courses; seniors who are preparing to teach German should take German 29.

8. Schiller.—The life of Schiller; *Wallenstein* and other selections. II; (3).

Prerequisite: Three years of college German, or equivalent.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	8	3	—	2	—	2	—	2	—	205 L. H.	Lessing

11. German Literature After the Reformation.—Lectures; recitations; reports on assigned collateral reading. II; (3).

Prerequisite: German 26.

Germanic Languages and Literature

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	11	3	—	3	—	3	—	3	—	205 L. H.	Lessing

19a-19b. Goethe's Faust.—The Faust legend and early Faust books and plays; the genesis of Goethe's *Faust*; reading of both parts. *I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	19a	2	—	—	11	—	11	—	—	215 L. H.	Goebel

SECOND SEMESTER

German	19b	2	—	Schedule the same as for 19a (first semester).							
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25. Teachers' Course.—Discussion of methods; examination of textbooks. (Open to seniors and special students who have 20 hours' credit in German.) *II*; (2).

Prerequisite: German 29a or equivalent; completion of or registration in Education 1 or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	25	2	—	—	2	—	2	—	—	215 L. H.	Blaisdell

26. German Literature to the End of the Reformation.—Lectures; recitations; reports on assigned reading. *I*; (3).

Prerequisite: German 10, or 24, or 28a-28b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	26	3	—	3	—	3	—	3	—	205 L. H.	Lessing

[27. Lessing.—The life of Lessing; *Nathan der Weise*; *Emilia Galotti*, and other selections. Not given in 1915-16. *I*; (3).]

29a-29b. Advanced Composition.—Themes on Germany and German life, based on suitable reading, discussed in German. *I, II*; (3).

Prerequisite: German 17.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	29a	3	—	1	—	1	—	1	—	212 U. H.	Koller

SECOND SEMESTER

German	29b	3	—	Schedule the same as for 29a (first semester).							
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30a-30b. Thesis Course.—(Intended primarily for candidates for honors in German, but open to other seniors.) *I, II*; *(1 or 2).

Prerequisite: Senior standing in College, and three years of college German or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	30a	*1 or 2	—							(Arrange)	Goebel Lessing Brooks Bloomfield

SECOND SEMESTER

German	30b	*1 or 2	—							(Arrange)
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*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Germanic Languages and Literature

31. Middle High German.—I; (2).

Prerequisite: Senior or graduate standing; three years of college German.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	31	2	—	—	—	10	—	10	—	215 L. H.	Goebel

32. History of German Civilization.—Readings; lectures; discussions. I; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	32	3	—	2	—	2	—	2	—	215 L. H.	Brooks

[39a-39b. **Goethe and Schiller.**—Interpretation of Goethe's poems. Goethe's *Tasso*; Schiller's *Ueber naive und sentimentalische Dichtung*. Not given in 1915-16. I, II; (2)]

Courses for Graduates

Students desiring to take German as a major should have completed a four years' course of undergraduate study in German, corresponding to the four years' course at this University, and should be familiär with the principal works of the writers of the classical and modern periods of German literature, show a general knowledge of the history of German literature, and be able to follow lectures in the German language.

A reading knowledge of Latin and French is required. It is desirable that candidates for the degree of Ph.D. have some knowledge of Greek. All students are expected to have had a course in German history.

101. Seminar in Germanic Philology.—Training in original research; results of special value may be published in the *Journal of English and Germanic Philology*. *Once a week; I, II; (1 unit).*

BOTH SEMESTERS											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
German	101	1 unit	—	10	—	—	—	—	—	203-A L. H.	Goebel

103. Introduction to the Historical Study of the Germanic Languages.—History of German Philology; comparative grammar of the Old Germanic dialects. Lectures; discussions of special topics. *Twice a week; II; (1 unit).*

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
German	103	1 unit	—	—	10	—	10	—	—	215 L. H.	Goebel

104. Gothic.—Grammar and literature. *Twice a week; I; (1 unit).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	104	1 unit	—	—	10	—	10	—	—	215 L. H.	Goebel

[**105. Old High German.**—Grammar and interpretation of the oldest literary documents. *Three times a week; II; (1 unit).* (Not given in 1915-16.)]

[**109. Goethe's and Schiller's Philosophy.**—*Twice a week; I, II; (1 unit).* (Not given in 1915-16.)]

Germanic Languages and Literature

110. Early German Drama.—German drama to the time of the Reformation; medieval religious drama; Shrovetide plays; beginnings of the humanistic drama. *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	110	1 unit	—	3	—	3	—	—	—	215 L. H.	Brooks

113. German Literature of the Fifteenth and Sixteenth Centuries.—Survey of the literature on the background of the general history of the time; Luther and the Reformation; Mastersingers and folksong; the Reformation drama; Hans Sachs; Brant; Fischart; the chap books; the English comedians. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	113	1 unit	—	3	—	3	—	—	—	215 L. H.	Brooks

115. History of German Literature from Goethe's Death to the Present Time.—*Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	115	1 unit	—	—	2	—	2	—	—	205 L. H.	Lessing

117. History of German Literature During the Eighteenth Century.—*Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	117	1 unit	—	—	—	11	—	11	—	215 L. H.	Goebel

[118. The German Drama Since Schiller.—Research. *Twice a week; I, II; (1 unit).* (Not given in 1915-16.)]

119. The German Novel.—Research. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	119	1 unit	—	—	3	—	3	—	—	205 L. H.	Lessing

121. Walther von der Vogelweide.—Lectures and interpretations. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	121	1 unit	—	—	—	10	—	10	—	215 L. H.	Goebel

125. History of the German Language.—*Three times a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	125	1 unit	—	9	—	9	—	9	—	215 L. H.	Green

B. SCANDINAVIAN

Undergraduate Courses Not Open to Freshmen

1a-1b. Elementary Norwegian.—Grammar, pronunciation, composition, easy reading. *I; (3); II; (2).*

Germanic Languages and Literature

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	1a	3	—	(Arrange)						209 L. H.	Flom

SECOND SEMESTER						
Scandinavian	1b	2	—	(Arrange)	209 L. H.	Flom

2a-2b. **Elementary Swedish.**—Grammar, pronunciation, composition, easy reading. *I, II*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	2a	2	—				(Arrange)			209 L. H.	Flom

SECOND SEMESTER					
Scandinavian	2b	2	—	(Arrange)	209 L. H. Flom

6. **Ibsen's Social Dramas.**—Lectures; interpretation of four of the social dramas; Ibsen's technique. Archer's translation is used. *II*; (2).

Prerequisite: Junior standing.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Scandinavian	6	2	—	—	9	—	9	—	—	205 L. H.	Flom

12. **Norse Mythology.**—Primitive religion; the religious belief of the Norseman in pre-Christian times; interpretation of the principal myths. *I*; (2).

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	12	2	—	—	9	—	9	—	—	205 L. H.	Flom

[14. History of Old Norse Literature.—II; (2). Not given in 1915-16.]

30. **Scandinavian Drama.**—History of Scandinavian dramatic theory; problems in modern drama. *I*; (1).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	30	1	—	—	—	10	—	—	—	209 L. H.	Flom

40. **Germanic Mythology.**—Lectures; interpretation of the sources.
II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	40	2	—	(Arrange)						209 L. H.	Flom

Courses for Graduates

Preparation for graduate work in the Scandinavian languages or literature must include a reading knowledge of one of the Scandinavian languages and systematic work in the undergraduate courses in Scandinavian or their equivalent. Any graduate student in language may, however, be admitted to the purely philological courses.

101. **Old Norse.**—Introduction to the language as a member of the Germanic group. Reading of the Prose *Edda* with selections from the Icelandic Sagas. *I, II; (I unit).*

BOTH SEMESTERS

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Scandinavian	101	1 unit	—							209 L. H.	Flom

[110. **Advanced Old Norse.**—The *Elder Edda*. *Twice a week; I, II; (1 unit)*. (Not given in 1915-16.)]

140. **Scandinavian Paleography.**—*II; (1 unit)*. *Time to be arranged.*
Associate Professor FLOM

GREEK

(See CLASSICS.)

HISTORY

EVARTS BOUTELL GREENE, Ph.D., *Professor*
CLARENCE WALWORTH ALVORD, Ph.D., *Professor*
LAURENCE MARCELLUS LARSON, Ph.D., *Professor*
ALBERT HOWE LYBYER, Ph.D., *Associate Professor*
WILLIAM SPENCE ROBERTSON, Ph.D., *Assistant Professor*
PAUL VAN BRUNT JONES, Ph.D., *Associate*
THEODORE CALVIN PEASE, Ph.D., *Associate*
ARTHUR CHARLES COLE, Ph.D., *Associate*
ELIZABETH PARNHAM BRUSH, A.M., *Assistant*
JAY EARLL MILLER, A.M., LL.B., *Assistant*
Co-operating:

WILLIAM ABBOTT OLDFATHER, Ph.D., *Professor, Greek*
HOWARD VERNON CANTER, Ph.D., *Assistant Professor, Latin*

Major: 20 hours, excluding History 1a and 2a, and including (a) either History 1b or 2b; (b) six hours selected from courses for advanced undergraduates and graduates; and (c) any other courses offered in the department.

Minors: 20 hours, including (a) either Economics 1 or Political Science 1 and 3; and (b) one or two of the following subjects: economics, political science, law, sociology, the history of any literature, history of education, philosophy, and physiography. Courses in any foreign language may be accepted in satisfaction of this requirement, if the student can show his ability to read ordinary historical prose in that language.

Courses for Undergraduates

1a-1b. Continental European History.—Europe from the fourth century to the present time. (The work of neither semester may be taken separately without special permission.) *I, II; (4)*.

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
History	1a	4	Lecture	—	10	—	10	—	—	100 Com.	Lybyer
			A	—	—	8	—	8	—	211 U. H.	Brush
			B	—	—	9	—	9	—	211 U. H.	Jones
			C	—	—	10	—	10	—	211 U. H.	Brush
(Junior-Sophomore Section)			D	—	—	10	—	10	—	311 L. H.	Lybyer
			E	—	—	10	—	10	—	306 L. H.	Jones
			F	—	—	11	—	11	—	211 U. H.	Brush
			G	—	—	1	—	1	—	211 U. H.	Miller
			H	—	—	2	—	2	—	211 U. H.	Jones
			K	—	—	—	9	—	9	211 U. H.	Brush

History

SECOND SEMESTER

History 1b 4 — Sections and schedule the same as for 1a (first semester).

2a-2b. English History.—First Semester: political history of England to 1603; the larger social, economic, and religious movements. Second Semester: the modern history of England; colonial and imperial development. *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	2a	3	Lecture	—	8	—	8	—	—	418 U. H.	Larson
			A	—	—	—	—	8	—	418 U. H.	Pease
			B	—	—	—	—	9	—	418 U. H.	Miller
			C	—	—	—	—	11	—	418 U. H.	Pease
			D	—	—	—	—	1	—	418 U. H.	Larson

SECOND SEMESTER

History 2b 3 — Sections and schedule the same as for 2a (first semester).

3a-3b. History of the United States.—First Semester: the Colonial Era; the Revolution; genesis of the Federal Constitution. Second Semester: the United States under the Constitution. (Either semester may be taken separately). *I, II; (3).*

Prerequisite: One year of college work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	3a	3	Lecture	8	—	—	—	8	—	100 Com.	Greene
			A	—	—	8	—	—	—	212 U. H.	Cole
			B	—	8	—	—	—	—	212 U. H.	Cole
			C	—	—	—	8	—	—	212 U. H.	Cole
			D	—	—	8	—	—	—	305 L. H.	Greene

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	3b	3	Lecture	8	—	—	—	8	—	100 Com.	Robertson
			A	—	—	8	—	—	—	212 U. H.	Cole
			B	—	8	—	—	—	—	212 U. H.	Cole
			C	—	—	—	8	—	—	212 U. H.	Cole
			D	—	—	8	—	—	—	305 L. H.	Robertson

5. History of Greece.—*I; (3).* (See Greek 20.)

Prerequisite: One college course in history or the classics, and sophomore standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	5	3	—	3	—	3	—	3	—	120 L. H.	Oldfather

6. History of Rome.—*II; (3).* (See Latin 19.)

Prerequisite: One college course in history or the classics. Not open to freshmen.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	6	3	—	3	—	3	—	3	—	120 L. H.	Canter

[17. **The History of Illinois.**—The political, economic, and social development of a commonwealth in the Middle West, considered in its relation to the course of American history. *II*; (2). Not given in 1915-16.

Prerequisite: History 3a-3b or junior standing in any college of the University.]

18. **The Teaching of History.**—Preparation of students for the teaching of history in secondary schools. *I*; (2).

Prerequisite: History 1a-1b, 3a-3b, or their equivalent; senior standing,

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	18	2	—	—	3	—	3	—	—	311 L. H.	Cole

28a-28b. **Thesis.**—Special training in investigation for candidates for honors and for other seniors. *I, II*; (2). *Time to be arranged.*

Professor GREENE

Courses for Undergraduates and Graduates

(Open to seniors and to juniors of high standing. The ability to use French and German is desirable.)

4a-4b. **The Constitutional History of England.**—First Semester; institutional origins. Second Semester; modern constitutional practise. (Important for students specializing in history, political science, or law). *I, II*; (3).

Prerequisite: One year of college history.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	4a	3	—	10	—	10	—	10	—	305 L. H.	Larson

SECOND SEMESTER

History	4b	3	—	Schedule the same as for 4a (first semester).							
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7. **The Revolutionary and Napoleonic Era in Europe.**—*I*; (3).

Prerequisite: One year of college work in history or political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	7	3	—	9	—	9	—	9	—	305 L. H.	Lybyer

8. **Medieval Civilization.**—The religious, economic, and intellectual development of medieval society. *I*; (3).

Prerequisite: History 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	8	3	—	—	10	—	10	—	—	311 L. H.	Larson

9a-9b. **The Renaissance and the Reformation.**—The transition from medieval to modern ideals. *I, II*; (3).

Prerequisite: History 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	9a	3	—	—	2	—	2	—	—	311 L. H.	Jones

History

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	9b	3	—	Schedule the same as for 9a (first semester).							

[10. **The Development of American Society in the Eighteenth Century.—II**; (4). Not given in 1915-16.

Prerequisite: History 3a-3b.]

[12. **History of Germany.—I, II**; (2). Not given in 1915-16.]

14a-14b. American Constitutional History.—First Semester: political institutions at the close of the colonial era; early state constitutions and the confederation; the framing and ratification of the federal constitution. Second Semester: the development of the written and unwritten constitution since 1789. (Either semester may be taken separately.) *I, II*; (3).

Prerequisite: History 3a-3b or Political Science 1 and 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	14a	3	—	—	9	—	9	—	—	305 L. H.	Greene

SECOND SEMESTER

History	14b	3	—	—	9	—	9	—	—	305 L. H.	Robertson
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15. The Civil War and the Reconstruction in the United States.—II; (3).

Prerequisite: History 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	15	3	—	11	—	11	—	11	—	305 L. H.	Cole

16a-16b. The Exploration and Colonization of the West.—First Semester; the Mississippi Valley from the earliest European explorations to the close of the war of 1812. Second Semester; the Mississippi Valley since 1815, and the progress of western expansion to the Pacific. (Either semester may be taken separately.) *I, II*; (2).

Prerequisite: History 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	16a	2	—	—	10	—	10	—	—	305 L. H.	Alvord

SECOND SEMESTER

History	16b	2	—	Schedule the same as for 16a (first semester).							
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[19. **France in the Feudal and Later Middle Ages with Special Reference to Institutions.**—A reading knowledge of French is required. This course may be combined with History 8. *I*; (3). Not given in 1915-16.

Prerequisite: History 1a-1b.]

[20a. **Europe in the Nineteenth Century from 1815 to 1871.—I**; (3). Not given in 1915-16.

Prerequisite: One year of college work in history or political science.]

20b. Europe Since 1871.—II; (3).

Prerequisite: One year of college work in history or political science.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	20b	3	—	9	—	9	—	9	—	305 L. H.	Lybyer

21. The United States Since the Reconstruction.—Historical introduction to contemporary American politics. *I*; (3).

Prerequisite: History 3a-3b.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
History	21	3	—	8	—	8	—	—	305 L. H.	Robertson

26. The Latin-American Colonies.—The political, economic, social, and intellectual life of Spain during the period of discovery; the exploration, settlement, and civilization of Spanish America and the Philippines; the exploration and colonization of Brazil. *I*; (3).

Prerequisite: History 1a-1b or 3a-3b.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
History	26	3	—	2	—	2	—	2	—	305 L. H. Robertson

27. Latin-America from the Wars of Independence to the Present Time.—The leading Latin-American states; political parties; existing governments; relations with Europe and the United States; the Old Regime in Texas, Mexico, and California. *II*; (3).

Prerequisite: History 3a-3b.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
History	27	3	—	2	—	2	—	2	—	305 L. H. Robertson

29. The Far East.—The contact of Western nations with the Far East from the sixteenth century to the present time. *II*; (2).

Prerequisite: One year of college history, economics, or political science, and senior standing.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
History	29	2	—	8	—	8	—	—	305 L. H.	Greene

Courses for Graduates

Graduate work in history presupposes two years of college work in this subject, or sixteen semester hours, which should include courses in European and American history corresponding roughly to History 1a-1b and 3a-3b in this University. Linguistic preparation, especially in French and German, is important. For medieval history some knowledge of Latin is essential, and Spanish is useful for certain fields of American history. No student will be recommended for the master's degree in this department who has not shown his ability to read ordinary historical literature in at least one modern language other than English.

Advanced courses in history at the University of Illinois are of three kinds: (1) For information and guidance in general reading. (2) Instruction in methodology, historiography, and bibliography. A part of this work (in course 103) is required of all graduate students in history during their first year. (3) Seminar courses for the study of special fields with a view to training in the methods of historical criticism and research.

History

Illinois Survey.—Students have an opportunity to pursue research in western history in connection with the Illinois Survey, an organization for the purpose of carrying on systematic studies in the history of Illinois.

Attention is also called to the fact that the University of Illinois has for some time co-operated with the Illinois State Historical Society and the Trustees of the State Historical Library, in the gathering and editing of archive material. As a result instructors and graduate students in the department have contributed from time to time to the publications of these state organizations, and have been given useful training in the study of manuscript as well as printed material.

The Historical Club, consisting of graduate students in the department, which meets twice a month, gives an opportunity for informal discussion of historical topics.

101. Seminar in American History.—Bibliography; solution of typical problems; reports on the progress of investigations. *Two hours, once a week; I, II; (1 to 2 units).*

In connection with this course, direction in research is offered as follows:

- | | |
|----------------------------------|---|
| A. American history before 1789. | Professor GREENE |
| B. American history since 1789. | Assistant Professor ROBERTSON, Dr. COLE |
| C. The history of the West. | Professor ALVORD |
| D. American church history. | Professor GREENE |
| E. Latin-American history. | Assistant Professor ROBERTSON |

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	101	1-2 units	—	—	—	—	—	—	8,9	303 L. H.	Greene and others

102. Studies in English History.—Selected problems from the history of England in the later middle ages and the early modern period. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	102	1 unit	—				(Arrange)			303 L. H.	Larson

103. Historiography and Historical Method.—Selected problems; studies of representative historians; readings in French and German historical literature. Required of all candidates for an advanced degree in history who do not present evidence of similar training elsewhere. *Twice a week; I, II; (½ unit).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	103	½ unit	—	—	4	—	4	—	—	303 L. H.	Lybyer and others

104. Research in European History.—Direction is offered by members of the department as follows:

- | | |
|--|----------------------------|
| A. Medieval history. | Professor LARSON |
| B. Modern history of Continental Europe. | Associate Professor LYBYER |
| C. English history. | Professor LARSON |
| D. Renaissance and Reformation. | DR. JONES |
- I, II; (1 to 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	104	1-2 units	—							303 L. H.	Lybyer Larson

105. Studies in the History of the West.—Subject for 1915-16: The West in American Diplomatic History, 1775-1814. *Once a week, I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	105	1 unit	—							303 L. H.	Alvord

111. Spanish-American Relations.—The relations of the Latin-American States with Europe and the United States. An intensive study of such topics as the Monroe Doctrine, and the development of international trade. *Once a week; I, II; (½ to 1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	111	½-1 unit	—							303 L. H.	Robertson

112. Studies in American Religious History.—Questions of Church and State. *Once or twice a week at the option of the instructor; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	112	1 unit	—							303 L. H.	Greene

HORTICULTURE

JOSEPH CULLEN BLAIR, M.S., *Professor, Horticulture*

*JOHN WILLIAM LLOYD, M.S., *Professor, Olericulture*

CHARLES SPENCER CRANDALL, M.S., *Professor, Pomology*

CHARLES MULFORD ROBINSON, A.M., *Professor, Civic Design*

HERMAN BERNARD DORNER, M.S., *Assistant Professor, Floriculture*

BETHEL STEWART PICKETT, M.S., *Assistant Professor, Pomology*

WILHELM MILLER, Ph.D., *Assistant Professor, Landscape Horticulture*

RALPH RODNEY ROOT, M.L.A., *Assistant Professor, Landscape Gardening*

EARNEST WINFIELD BAILEY, M.S., *Assistant Professor, Pomology*

OSCAR S WATKINS, B.S., *Associate, Horticultural Chemistry*

CHARLES ELMER DURST, M.S., *Associate, Olericulture*

SIMEON JAMES BOLE, A.M., *Associate, Pomology*

JOHN JOSEPH GARDNER, M.S., *Associate, Pomology*

IRA DENT ALLISON, B.S., *Associate, Horticulture*

FRANK A CUSHING SMITH, M.L.A., *Associate, Landscape Design*

FREDERICK NOBLE EVANS, M.L.A., *Associate, Landscape Design*

ALFRED JOSEPH GUNDERSON, B.S., *Instructor, Pomology*

FRANK LOTAN VENNING, *Instructor, Landscape Design*

WILLIAM SANFORD BROCK, A.B., B.S., *Instructor, Pomology*

WILLIAM KING PALMER, B.S., *Instructor, Floriculture*

ARTHUR SAMUEL COLBY, M.S., *Assistant, Pomology*

HOWARD DEXTER BROWN, B.S., *Assistant, Olericulture*

AUGUST GEORGE HECHT, B.S., *Assistant, Floriculture*

DUANE TAYLOR ENGLIS, A.M., *Assistant, Floricultural Chemistry*

EDWARD GEORGE LAUTERBACH, B.S., *Assistant, Floriculture*

LEON DEMING TILTON, B.S., *Assistant, Landscape Extension*

*Absent on leave.

Horticulture

1a. Elements of Horticulture.—Fruit growing, vegetable gardening, and ornamental planting, with special reference to the farm home. Required of all freshmen in the general course in Agriculture. Recitations; practical exercises. *A student is required to register in the same section for both laboratory and quiz. I; (2).*

Subject	No.	Credits	FIRST SEMESTER							Room	Instructor
			Section	M	T	W	T	F	S		
Horticulture	1a	2	A, Quiz	11	—	11	—	—	—		Pickett
			B, Quiz	11	—	11	—	—	—		Gardner
			C, Quiz	11	—	11	—	—	—		Colby
			D, Quiz	10	—	10	—	—	—		Brock
			E, Quiz	—	10	—	10	—	—		—
			F, Quiz	—	10	—	10	—	—		Bole
			G, Quiz	—	11	—	11	—	—	Room	Pickett
			H, Quiz	—	10	—	10	—	—	numbers	Gardner
			I, Quiz	—	3	—	3	—	—	to be	Bole
			J, Quiz	—	3	—	3	—	—	posted	Colby
			K, Quiz	—	3	—	3	—	—	at	Brock
			L, Quiz	—	10	—	10	—	—	the	—
			A, Lab.	—	8,9	—	—	—	—	beginning	Pickett
			B, Lab.	—	1,2	—	—	—	—	of	Gardner
			C, Lab.	—	—	—	8,9	—	—	the	Colby
			D, Lab.	—	—	—	—	10,11	—	semester.	Brock
			E, Lab.	8,9	—	—	—	—	—		—
			F, Lab.	1,2	—	—	—	—	—		Bole
			G, Lab.	—	—	8,9	—	—	—		Pickett
			H, Lab.	—	—	1,2	—	—	—		Gardner
			I, Lab.	—	—	—	—	8,9	—		Colby
			J, Lab.	—	—	—	—	1,2	—		Brock
			K, Lab.	—	—	—	—	—	8,9		—
			L, Lab.	—	—	—	—	—	10,11		Bole

1b. Elements of Horticulture.—A continuation of 1a. Required of all freshmen in the general course in Agriculture. *A student is required to register in the same section for both laboratory and quiz. II; (2).*

Subject	No.	Credits	SECOND SEMESTER							Room	Instructor
			Section	M	T	W	T	F	S		
Horticulture	1b	2	A, Quiz	11	—	11	—	—	—		Pickett
			B, Quiz	11	—	11	—	—	—		Gardner
			C, Quiz	11	—	11	—	—	—		Colby
			D, Quiz	10	—	10	—	—	—		Brock
			E, Quiz	—	10	—	10	—	—		—
			F, Quiz	—	10	—	10	—	—		Bole
			G, Quiz	—	11	—	11	—	—	Room	Pickett
			H, Quiz	—	10	—	10	—	—	numbers	Gardner
			I, Quiz	—	3	—	3	—	—	to be	Bole
			J, Quiz	—	3	—	3	—	—	posted	Colby
			K, Quiz	—	3	—	3	—	—	at	Brock
			L, Quiz	—	10	—	10	—	—	the	—
			A, Lab.	—	8,9	—	—	—	—	beginning	Pickett
			B, Lab.	—	1,2	—	—	—	—	of	Gardner
			C, Lab.	—	—	—	8,9	—	—	the	Colby
			D, Lab.	—	—	—	—	10,11	—	semester.	Brock
			E, Lab.	8,9	—	—	—	—	—		—
			F, Lab.	1,2	—	—	—	—	—		Bole
			G, Lab.	—	—	8,9	—	—	—		Pickett
			H, Lab.	—	—	1,2	—	—	—		Gardner
			I, Lab.	—	—	—	—	8,9	—		Colby
			J, Lab.	—	—	—	—	1,2	—		Brock
			K, Lab.	—	—	—	—	—	8,9		—
			L, Lab.	—	—	—	—	—	10,11		Bole

2. Small Fruits and Grapes.—The strawberry, raspberry, blackberry, dewberry, currant, gooseberry, grape. History; extent of cultivation; soil; location; fertilizers; propagation; planting; tillage; pruning; insect enemies; diseases; varieties; harvesting; marketing. Lectures; reference readings. *II*; (2).

Prerequisite: Horticulture 1a and 1b or their equivalents, 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	2	2	—	11	—	11	—	11	—	309 Ag.	Bole

3. Vegetable Gardening.—The production and marketing of vegetables. Lectures; reference readings; practical exercises. *II*; (5).

Prerequisite: Horticulture 1a and 1b or their equivalents.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	3	5	Lecture	3	—	3	—	3	—	309 Ag.	Durst
			Laboratory	—	3,4	—	3,4	—	8,9	V. G.	Durst
											Brown

4. Plant Houses.—Construction, cost, and maintenance; heating; ventilating. *I*; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	4	4	—	3	3	3	3	—	—	F. G.	Dorner

5. Plant Propagation.—Grafts; buds; layers; cuttings; seeds. Lectures; laboratory; quizzes. *II*; (5).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	5	5	Lecture	—	1	—	1	—	—	F. G.	Dorner Hecht Dorner Hecht Dorner Hecht
			A, Quiz	1	—	—	—	—	—	F. G.	
			B, Quiz	2	—	—	—	—	—	F. G.	
			C, Quiz	3	—	—	—	—	—	F. G.	
			A, Lab.	—	—	1,2	—	1,2	—	F. G.	
			B, Lab.	—	2,3	—	2,3	—	—	F. G.	

6. Nursery Methods.—Some details of nursery management and their relation to horticulture in general. Lectures; reference readings. *II*; (2).

Prerequisite: Horticulture 5; Entomology 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	6	2	—	—	1,2	—	1,2	—	—	302 Ag.	Bailey Allison

7. Spraying.—Materials, appliances, and methods employed in combating insects and fungus diseases. Lectures; reference readings; laboratory; field work. *II*; (3).

Prerequisite: Horticulture 1a and 1b or their equivalents; Chemistry 1; Entomology 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	7	3	Lecture	—	—	1	—	—	—	H. B.	Watkins
			Quiz	—	—	2	—	—	—	H. B.	Watkins
			A, Lab.	10,11	—	—	—	10,11	—	H. B.	Watkins
			B, Lab.	1,2	—	—	—	1,2	—	H. B.	Watkins

Horticulture

8. Orcharding.—Pomaceous, drupaceous, and nut fruits; management of large commercial orchards; harvesting; grading; packing; storing; marketing. *I*; (5).

Prerequisite: Horticulture 1a and 1b or their equivalents, 5; Botany 1; Entomology 4.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	8	5	—	10	10	10	10	10	—	309, 303 Ag.	Crandall Bailey

[9. Forestry.—Forest trees; uses; distribution; artificial production; relations of forest and climate; forestry legislation and economy. *II*; (2). Not given, 1915-16.

Prerequisite: Botany 1, or an equivalent.]

10a. Rural Improvement.—Lectures; reference reading; field trips. *I*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	10a	2	Lecture	—	11	—	11	—	—	309 Ag.	Root

10b. Town Improvement.—Field trips; assigned readings; reports; lectures. *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	10b	2	Lecture	—	11	—	11	—	—	309 Ag.	Robinson Evans

11. Study of Cultivated Plants.—The relationship and classification of economic and ornamental plants of the temperate zone; identification of species; examination of living plants and herbarium specimens. Lectures; assigned readings. *I*; (2).

Prerequisite: Botany 4a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	11	2	—	—	2	—	2	—	—	703 Ag.	Blair Crandall

12. Evolution of Horticultural Plants.—History, botanical classification, and geographical distribution of cultivated plants; modification under culture; theoretical causes and observed factors that influence variation, particularly food supply, climate, and cross-fertilization. *I*; (3).

Prerequisite: Two years of University work, including Horticulture 8 and Botany 4a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	12	3	—	11	—	11	—	11	—	309 Ag.	Crandall

15a. Principles of Plant Growing.—Preparation of soils for greenhouse crops; fertilizers; potting and shifting plants; watering. Lectures; practical greenhouse work. *II*; (5).

Prerequisite: Horticulture 5; Botany 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	15a	5	Lecture	—	10	—	10	—	—	F. G.	Doerner
			Laboratory	10,11	—	10,11	—	10,11	—	F. G.	Doerner Hecht

15b. Commercial Crops.—Greenhouse plants and cut flowers for wholesale and retail markets; the care and marketing of the crops. Lectures; greenhouse-work. *I*; (5).

Prerequisite: Horticulture 15a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	15b	5	Lecture	—	1	—	1	—	—	F. G.	Palmer
			Laboratory	1,2	—	1,2	—	1,2	—	F. G.	Palmer

17. Commercial Fruit Culture.—Practical work in houses and fruit plantations; reference readings; seminar. (For students specializing in horticulture.) *I*; (5).

Prerequisite: Horticulture 2, 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	17	5	—	1,2	—	1,2	1,2	1,2	8,10	V. G.	Crandall Bailey

18. Experimental Horticulture.—Methods and difficulties in horticultural investigations; the planning of experiments; recording and interpretation of results. (For advanced students preparing for experiment station work.) *II*; (5).

Prerequisite: Twenty hours' work in horticulture.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	18	5	—	10	10	10	10	10	—	302 Ag.	Blair Pickett Watkins

19. Amateur Floriculture.—Window gardening; growing of flowers upon the home grounds; containers; potting soils; fertilizers; preparation and planting of flower beds; propagation and culture of plants for window and garden. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	19	3	—	9	—	9	—	9	—	F. G.	Hecht

21a. Landscape Design (Elementary Course).—Simple composition as applied to landscape design. *I*; (4).

Prerequisite: Architecture 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	21a	4	Lecture	2	—	—	—	—	—	302 Ag.	Evans
			Laboratory				(Arrange)			307 Ag.	Smith Venning

Horticulture

21b. Landscape Design (Elementary Course).—Types of grafting and presentation used in office practise. *II*; (4).

Prerequisite: Horticulture 21a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	21b	4	Lecture	2	—	—	—	—	—	302 Ag.	Evans
			Laboratory					(Arrange)		307 Ag.	Smith Venning

22. Special Investigation and Thesis.—*I* or *II*; *(5-10).

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	22	*5 to 10	—					(Arrange)		—	—

23a-23b. Landscape Design (Second Course).—Drafting; field trips; assigned readings; reports; occasional lectures. *I, II*; (4).

Prerequisite: Horticulture 21b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	23a	4	Lecture	—	—	2	—	—	—	302 Ag.	Evans
			Laboratory					(Arrange)		307 Ag.	Evans Venning

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	23b	4	Lecture	—	—	—	—	10	—	302 Ag.	Evans
			Laboratory					(Arrange)		307 Ag.	Evans Venning

24a. Trees and Shrubs.—Lectures; reference readings; field trips. *II*; (3).

Prerequisite: Botany 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	24a	3	Lecture	3	—	3	—	3	—	302 Ag.	Root
			Laboratory					(Arrange)		—	Root

24b. Trees and Shrubs.—(Continuation of 24a). Lectures; reference readings; field trips. *I*; (3).

Prerequisite: Horticulture 24a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	24b	3	Lecture	3	—	3	—	3	—	302 Ag.	Root
			Laboratory					(Arrange)		—	Root

25a-25b. Advanced Landscape Design.—Drafting; field trips; assigned readings; reports; occasional lectures; 15 hours' drafting per week. *I, II*; (5).

Prerequisite: Horticulture 23b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	25a	5	Lecture	—	—	—	—	2	—	306 Ag.	Evans
			Laboratory					(Arrange)		307 Ag.	Root Evans Venning

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., *not* 2-5, but 2, or 3, or 4, or 5.

Horticulture

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	25b	5	Lecture	—	—	—	—	2	—	306 Ag.	Evans
			Laboratory				(Arrange)			307 Ag.	Root Robinson Evans

26a-26b. Planting Design.—Plant plans; conferences; library research; drafting. One conference and 8 hours drawing per week. *I, II; (3).*

Prerequisite: Horticulture 23a, 24b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	26a	3	Lecture	—	—	—	—	11	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

SECOND SEMESTER

Horticulture	26b	3	Lecture	—	—	—	—	11	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

27a-27b. Landscape Practise.—Principles of construction. The preparation of construction drawings such as grading plans, working drawings, specifications, and reports. *I, II; (3).*

Prerequisite: C. E. 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	27a	3	Lecture	—	—	—	2	—	—	302 Ag.	Smith
			Laboratory				(Arrange)			307 Ag.	Smith

SECOND SEMESTER

Horticulture	27b	3	Lecture	10	—	10	—	—	—	302 Ag.	Smith
			Laboratory				(Arrange)			307 Ag.	Smith

28. Exotics.—Temporary decorative plants used in landscape gardening. Lectures; planting plans; field trips. *II; (1).*

Prerequisite: Horticulture 23b, 24b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	28	1	Lecture	—	—	—	—	—	9	306 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root

29a. Garden Design.—The garden in its relation to the house; architectural harmony, utilization, topographic conditions, and planting for architectural or horticultural emphasis. 8 hours drafting; 1 lecture. *I; (3).*

Prerequisite: Architecture 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	29a	3	Lecture	—	—	10	—	—	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root Venning

29b. Garden Design.—The designing of public gardens and open spaces and their relation to garden design. 8 hours drafting; 1 lecture. *II; (3).*

Prerequisite: Horticulture 23a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	29b	3	Lecture	—	—	10	—	—	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Venning

Horticulture

30. Decorative and Bedding Plants.—Tropical and sub-tropical plants used in decorative work in the conservatory; tender plants used in out-door bedding. Lectures; practical greenhouse work. *II*; (5).

Prerequisite: Horticulture 15a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	30	5	Lecture	—	8	—	8	—	—	F. G.	Hecht
			Laboratory	8,9	—	8,9	—	8,9	—	F. G.	Hecht

31. Garden Flowers.—The propagation and growing of annuals, herbaceous perennials, bulbs, and shrubs for cut flowers and ornamental plantings. *I*; (3).

Prerequisite: Horticulture 5; Botany 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	31	3	Lecture	10	—	10	—	10	—	F. G.	Dorner
			Laboratory	(Arrange)						F. G.	Dorner

32. Floral Decoration.—Cut flowers and plants in decorative work; arrangement of flowers in baskets, designs, and bouquets; table decoration; house decoration. (For floricultural students.) *II*; (4).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	32	4	Lecture	3	—	3	—	3	—	F. G.	Dorner
			Laboratory	—	—	—	—	8-12	F. G.	Dorner	

[33. Systematic Pomology.—Description, nomenclature, and classification of native and sub-tropical fruits; critical descriptions and identification with special reference to relationships and classifications of varieties. Training is given in judging and displaying fruits. *I*; (2). Not given, 1915-16.

Prerequisite: Horticulture 8.]

34. Vegetables Under Glass.—Practical training in the forcing of vegetables. Lectures; reference readings; laboratory. *I*; (3).

Prerequisite: Horticulture 3, 15a.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Horticulture	34	3	—	1,2	—	1,2	—	1,2	—	V. G.	Durst Brown

35. Private Conservatory Work.—Types of plants for large conservatories; arrangement; care. *II*; (3).

Prerequisite: Horticulture 15a, 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	35	3	—	(Arrange)						F. G.	Dorner

36. History of Landscape Gardening.—Lectures; reference readings; library sketches; reports. *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	36	2	—	—	11	—	11	—	—	309 Ag.	Root

37a-37b. Civic Design.—Lectures; field trips; reports. *I, II; (3).*

Prerequisite: Horticulture 23b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	37a	3	—							306-B Ag.	Robinson

(Arrange)

SECOND SEMESTER

Horticulture	37b	3	—							306-B Ag.	Robinson
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(Arrange)

38. Office Practise in Landscape Gardening.—Lectures; office work; reports. Actual practise in carrying out landscape plans in the field. *I or II; (2).*

Prerequisite: Horticulture 27a, 23b.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	38	2	Lecture	—	2	—	2	—	—	303 Ag.	Root
			Laboratory							—	Root

(Arrange)

39. Special Lectures.—Lectures by members of the faculty and invited lecturers, on the working out of various problems in landscape gardening. Required of students taking the professional course in landscape gardening. One lecture per week with written reports. *I or II; (1).*

Prerequisite: Permission of the instructor in charge.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	39	1	—	—	—	—	3	—	—	309 Ag.	Root

40a. Trees and Shrubs (Advanced Course).—Laboratory; field and herbarium work; assigned readings; seminar conferences. *I; (3).*

Prerequisite: Horticulture 24b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	40a	3	Lecture	—	1	—	1	—	—	306 Ag.	Root
			Laboratory							306 Ag.	—

(Arrange)

40b. Trees and Shrubs (Advanced Course).—Special problems in the classification and arrangement of plants as to their leaf color. *II; (3).*

Prerequisite: Horticulture 24b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	40b	3	Lecture	—	1	—	1	—	—	306 Ag.	Root
			Laboratory							306 Ag.	Venning

(Arrange)

41. Civic Design (Elementary Course).—Lectures introductory to city planning. Lectures; reference readings; reports. *II; (1).*

Prerequisite: Horticulture 23a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	41	1	—								

(Arrange)

Robinson
Evans

Household Science

42. Landscape Design (Elementary Course).—The principles and application of landscape design to private grounds in the country and city. Lectures; reference readings; reports; six hours' drafting per week. *II*; (3).

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Horticulture	42	3	Lecture	—	—	—	1	—	—	209 Ag.	Smith
			Laboratory			(Arrange)				209 Ag.	Smith

Courses for Graduates

At least two years of collegiate work in horticulture and allied subjects and specific preparation for the chosen topics are required for entrance upon major work in this department.

102. Pomology.—Adaptation, propagation, cultivation, or pruning of small fruits. Conferences. *II*; ($\frac{1}{2}$ to 1 unit). *Time to be arranged.*

Professor CRANDALL

103. Olericulture.—Structure, cultural requirements, and improvement of vegetables. Conferences. *I, II*; (1 to 2 units; a student working part time and extending his study for the master's degree over two years may register $\frac{1}{2}$ to 1 unit for each of the four semesters.) *Time to be arranged.*

Professor BLAIR, Professor LLOYD

108. Pomology.—The relationship, adaptation, improvement, propagation, cultivation, pruning, protection, preservation, or marketing of orchard fruits. Conferences. *I, II*; (1 to 2 units; a student working part time and extending his study for the master's degree over two years may register for $\frac{1}{2}$ to 1 unit for each of the four semesters.) *Time to be arranged.*

Professor BLAIR, Professor CRANDALL

HOUSEHOLD SCIENCE

ISABEL BEVIER, Ph.M., *Professor and Director*

RUTH WHEELER, Ph.D., *Assistant Professor*

LURENE SEYMOUR, Ph.B., B.S., *Associate*

CORA EMELINE GRAY, M.S., *Associate*

MAUD EDNA PARSONS, A.B., *Associate*

FLORENCE HARRISON, B.S., *Associate*

GEORGIA ELIZABETH FLEMING, B.S., *Instructor*

GRACE ESTHER STEVENS, A.B., *Instructor*

ANNA WALLER WILLIAMS, A.M., *Instructor*

GRETA GRAY, A.M., *Instructor*

MAMIE BUNCH, A.B., *State Leader in Home Economics Demonstration*

MARGARET B STANTON, A.M., *Instructor*

LEONA HOPE, *Instructor*

OLIVE B PERCIVAL, B.S., *Assistant*

FANNIE MARIA BROOKS, A.B., *Assistant*

Major: 20 hours from any courses offered by the department, excluding Household Science 2 and 7a-7b, and including Household Science 5a-5b, 6, 12, 3, and 10.

Minors: 20 hours from either (a) chemistry, bacteriology, and physiology; or (b) economics (a minimum of eight hours), along with one or two of the following subjects: art and design, education, history, psychology, and sociology.

Food

1. Selection and Preparation of Food.—The nature and uses of foods, their chemical composition, and the changes effected by heat, cold, or fermentation; principles of selection, illustrated by marketing expeditions; processes of manufacture; combinations of different kinds. *II*; (3).

Prerequisite: Entrance credit in Physics; Chemistry 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	1	3	Lecture	—	—	—	11	—	—	235 W. B.	Stevens Stanton Gray, G. Williams
			A, Quiz	—	—	—	—	8	—		
			B, Quiz	—	—	—	—	10	—		
			C, Quiz	—	—	—	—	10	—		
			D, Quiz	—	—	—	—	2	—		
			A, Laboratory	8,9	—	8,9	—	—	—		
			B ₁ , Laboratory	10,11	—	10,11	—	—	—		
			B ₂ , Laboratory	10,11	—	10,11	—	—	—		
			C, Laboratory	2,3	—	2,3	—	—	—		
			C, Laboratory	2,3	—	2,3	—	—	—		
			D, Laboratory	—	8,9	—	8,9	—	—		
			D, Laboratory	—	8,9	—	8,9	—	—		
			E, Laboratory	—	2,3	—	2,3	—	—		
			E, Laboratory	—	2,3	—	2,3	—	—		

6. Economic Uses of Food.—(Continuation of 1.) The economics of the food question; uses and applications of preservatives. *I*; (3).

Prerequisite: Household Science 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	6	3	Lecture	—	—	—	11	—	—	235 W. B.	Stevens Stanton Gray, G.
			A, Quiz	—	—	—	—	8	—		
			B, Quiz	—	—	—	—	10	—		
			C, Quiz	—	—	—	—	10	—		
			D, Quiz	—	—	—	—	2	—		
			A, Laboratory	8,9	—	8,9	—	—	—		
			B ₁ , Laboratory	10,11	—	10,11	—	—	—		
			B ₂ , Laboratory	10,11	—	10,11	—	—	—		
			C, Laboratory	2,3	—	2,3	—	—	—		
			C, Laboratory	2,3	—	2,3	—	—	—		
			D, Laboratory	—	8,9	—	8,9	—	—		
			D, Laboratory	—	8,9	—	8,9	—	—		
			E, Laboratory	—	2,3	—	2,3	—	—		
			E, Laboratory	—	2,3	—	2,3	—	—		

14a-14b. Problems in the Preparation and Service of Food.—(Continuation of courses 1 and 6.) Preparation and service of meals for a family; cost and dietetic values; the preparation of food in quantities; individual problems in the manipulation of food materials. *I, II*; (3).

Open to: (a) those who are preparing for lunch-room management; (b) those who are preparing for extension work; (c) in special cases, those who have completed the major in household science.

Prerequisite: Household Science 1, 6; Chemistry 1, 2, 3 or 2a; junior standing, and the consent of the instructor.

Household Science

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	14a	3	Laboratory	—	5-7:30	—	5-7:30	—	—	117 W. B.	Gray, C. Williams
				—	10,11	—	10,11	—	10,11		

SECOND SEMESTER

Household Science	14b	3	Sections and schedule the same as for 14a (first semester).								
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5a-5b. Dietetics.—The principles of diet; the relation of food to health; influence of age, sex, and occupation on diet; the construction of dietaries; dietetic treatment of certain diseases. Laboratory. *I, II; (3).*

Prerequisite: Household Science 1, 6; Physiology 4; Chemistry 1, 2, 3 or 2a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	5a	3	—	11	—	11	—	11	—	219 W. B.	Wheeler

SECOND SEMESTER

Household Science	5b	3	Sections and schedule the same as for 5a (first semester).								
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4. Food and Nutrition.—Application of the principles of pure science

Prerequisite: Bacteriology 5; Chemistry 1, 2, 3 or 2a, 13a, 9, 9c; five hours in botany or zoology; Household Science 1, 5a-5b, 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	4	5	—	8,9	8,9	8,9	8,9	8,9	—	219 W. B.	Wheeler

18a-18b. Lunch Room Management.—Organization and equipment of lunch rooms. Laboratory practise. *I, II; (5).*

Prerequisite: Household Science 1, 5a-5b, 6, 14a-14b; Economics 1 or 2, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	18a	5	Lecture and Quiz	—	9	—	9	—	9	219 W. B.	Parsons
			Laboratory, two consecutive 3-hr. periods (arrange).								

SECOND SEMESTER

Household Science	18b	5	Schedule and sections the same as for 18a (first semester).								
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19. Costume Design.—Based on the study of appropriate dress, proportion of parts, outline of figure, and color harmony. *I; (2).*

Prerequisite: Household Science 7; Art and Design 1, 12; 30 hours of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	19	2	—	8	—	8	—	—	—	113 W. B.	Hope

The House

2. Home Architecture and Sanitation.—Situation, surroundings, and construction of the house; hygiene, heating, lighting, ventilating, water supply, and drainage. House planning and sanitary plumbing, fixtures, and internal drainage; making skeleton plans. *I*; (2).

NOTE: Only one credit for seniors.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	2	2	Lecture	—	9	—	—	—	—	113 W. B.	Bevier Fleming Gray, G. Clark Ash
			A, Quiz	—	—	—	8	—	—		
			B, Quiz	—	—	—	8	—	—		
			C, Quiz	—	—	—	9	—	—		
			D, Quiz	—	—	—	9	—	—		
			E, Quiz	—	—	—	9	—	—		
			F, Quiz	—	—	—	3	—	—		

3. Elementary Home Decoration.—Evolution of the house and home; homes of primitive peoples; theory of color and its application in home decoration; furnishings from a sanitary and artistic standpoint. *II*; (2).

Prerequisite: Art and Design 12; Household Science 2; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	3	2	—	—	9	—	9	—	—	113 W. B.	Bevier Fleming Gray, G.

10. Household Management.—Expenditure of the income; organization of the household; care of the house and family; home nursing; domestic service problem. Laboratory work in practise apartment. *II*; (2).

Prerequisite: Household Science 1, 2, 6; Economics 1 or 2; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	10	2	—	—	11	—	11	—	—	121 W. B.	Gray, C. Williams

7a-7b. Textiles.—Development of primitive industries; production of fibers used in textile manufacture; practise in judging cloth and in weaving. *I, II*; (2).

NOTE: Only one credit for seniors.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	7a	2	Lecture	—	10	—	—	—	—	113 W. B.	Seymour
			A, Quiz	3	—	—	—	—	—	117 W. B.	
			B, Quiz	—	—	3	—	—	—	117 W. B.	
			C, Quiz	—	—	—	10	—	—	117 W. B.	
			D, Quiz	—	—	—	3	—	—	117 W. B.	
Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	7b	2	Lecture	—	1	—	—	—	—	113 W. B.	Seymour
			A, Quiz	—	—	—	8	—	—	117 W. B.	
			B, Quiz	—	—	—	11	—	—	117 W. B.	
			C, Quiz	—	—	—	1	—	—	117 W. B.	

Household Science

12. Household Art and Clothing.—(Continuation of course 7a-7b. Materials for use in home and clothing; texture, quality, design in relation to form; color in relation to environment and personality; hygienic properties and cost. *II*; (3).

Prerequisite: Household Science 7a-7b; Art and Design 1, 12; 30 hours of university work; proof, by examination or otherwise, of the ability to sew.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	12	3	Lecture	—	8	—	—	—	—	113 W. B.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Seymour Fleming </div> </div>
			A, Laboratory	10,11	—	10,11	—	—	—	203 W. B.	
			B, Laboratory	1,2	—	1,2	—	—	—	203 W. B.	
			C, Laboratory	—	10,11	—	10,11	—	—	203 W. B.	
			D, Laboratory	—	1,2	—	1,2	—	—	203 W. B.	

17. Problems in the Study of Textiles.—The quality of material; microscopic and chemical analysis of fabrics; movements related to the textile industry. Lectures; laboratory. *II*; (3).

Prerequisite: Household Science 7a-7b, 12; Chemistry 1, 2, 3 or 2a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	17	3	Lecture	—	—	—	—	2	—	219 W. B.	Seymour
			Laboratory	2,3	—	2,3	—	—	—	215 W. B.	—

Courses for Teachers

11. *Teachers' Course.—The best methods of presenting the work, and its correlation with other subjects. Practise in planning, and presenting of courses. *II*; (3).

Prerequisite: Household Science 1, 2, 3, 5a-5b, 6, 7a-7b, 12, and 13; laboratory work in sewing, Saturday morning, first semester; senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	11	3	—	—	10	—	10	—	—	116 W. B.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Bevier Seymour Harrison </div> </div>

13. History of Home Economics.—Origin and development of home economics; the work in different types of institutions; the planning of courses for these types. *I*; (2).

Prerequisite: Senior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	13	2	—	—	—	3	—	3	—	113 W. B.	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Bevier Harrison Seymour </div> </div>

9. Individual Problems.—Different phases of home economics. *II*; (3).

Prerequisite: Senior standing.

*Millinery for those taking Household Science 11 is given from 10 to 12 o'clock on Saturday the second semester, and sewing from 10 to 12 o'clock the first semester.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	9	3	—	2	—	2	—	2	—	119 W. B.	Bevier

Economics of the Family

15. Economics of the Family Group.—The economic relations of the family as a whole and as individuals. Retail market; sources of income, and social and industrial conditions affecting them; child labor; economic position of women. *I; (3).*

Prerequisite: Household Science 3, 6, 10, 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	15	3	—	2	—	2	—	2	—	117 W. B.	Stanton

16. Problems in the Economics of the Family Group.—Individual work in the senior seminar in economics. *I or II; *(2-4). Time to be arranged.*

Professor KINLEY

Prerequisite: Household Science 15.

Courses for Graduates

Students who wish to do graduate work in household science should specialize in either the scientific or the economic phase of the subject. In either case they must offer twenty credit hours of household science as given in the University of Illinois, or its equivalent, with a minimum of two years of chemistry, including organic chemistry, a year of biological science, and a year of either economics or sociology.

NOTE: Courses 4, 5, and 19, may be taken for graduate credit.

101. Home Economics.—Origin and development; industrial, educational, and sociological aspects. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor BEVIER

102. Special Investigations.—The application of the principles of bacteriology, chemistry, and physiology to the ordinary processes used in preparation of food; problems in nutrition. *Twice a week; I, II; (2 units). Time to be arranged.*

Professor BEVIER, Assistant Professors GOLDTHWAITE and WHEELER

103. Seminar.—Recent advances in nutrition. *Once a week; II; (½ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	103	½ unit	—	—	4	—	—	—	—	109 W. B.	Wheeler

ITALIAN

(See ROMANCE LANGUAGES and LITERATURE.)

JOURNALISM

(See RHETORIC, under THE ENGLISH LANGUAGE AND LITERATURE.)

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

LANDSCAPE GARDENING

(See HORTICULTURE.)

LATIN

(See CLASSICS.)

LAW

OLIVER ALBERT HARKER, A.M., LL.D., *Professor, Dean*FREDERICK GREEN, A.M., LL.B., *Professor*EDWARD HARRIS DECKER, A.B., LL.B., *Professor*JOHN NORTON POMEROY, A.M., LL.B., *Professor*CHESTER GARFIELD VERNIER, A.B., J.D., *Professor*WILLIAM GREEN HALE, B.S., LL.B., *Professor, Secretary*CHARLES ERNEST CARPENTER, A.M., LL.B., *Assistant Professor*

First Year Courses

NOTE.—In addition to the regular courses, first year students are required to attend one quiz-hour each week.

1a-1b. **Contracts.**—Williston's *Cases on Contracts*, Vols. I and II. Selected Illinois Cases. *I*; (4): *II*; (3).

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Law	1a	4	—	—	3	3	3	3	—	202*	Decker	

SECOND SEMESTER											
Law	1b	3	—	—	—	11	11	11	—	202	Decker

2a-2b. **Torts.**—Ames and Smith's *Cases on Torts*. *I*, *II*; (3).

				FIRST SEMESTER							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	2a	3	—	8	8	8	—	—	—	202	Hale

											SECOND SEMESTER					
Law	2b	3	—	—	3	3	3	—	—	202					Hale	

37. **Introduction to the Study of Law.**—*I*; (1).

Subject	No. Credits		Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Law	37	1	—	11	—	—	—	—	—	202	Decker	

3. **Real Property.**—(Case book to be announced later.) *II*; (3).

Subject	No. Credits		Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Law	3	3	—	8	8	8	—	—	—	202	Carpenter	

[4. **Common Law Pleading.**—*II*; (3). Not given in 1915-16.]

5. **Criminal Law.**—Beale's *Cases on Criminal Law*, (2nd edition). *I*; (4).

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Law	5	4	—	—	11	11	11	11	—	202	Vernier	

*All courses are given in the Law building.

6. **Personal Property.**—Gray's *Cases on Property*, Vol. I, (2nd edition). I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	6	2	—	—	—	—	8	8	—	202	Green

7. **Domestic Relations.**—Woodruff's *Cases on Domestic Relations*, (2nd edition). II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	7	2	—	—	—	—	8	8	—	202	Vernier

11. **Agency.**—Wambaugh's *Cases on Agency*. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	11	3	—	11	11	—	—	3	—	202	Carpenter

Second or Third Year Courses.

8. **Evidence.**—Thayer's *Cases on Evidence*, (2nd edition). II; (4).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	8	4	—	—	9	9	9	9	—	204*	Hale

9. **Sales.**—Williston's *Cases on Sales*, (2nd edition). I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	9	3	—	—	—	9	8	8	—	204	Hale

10. **Real Property.**—Gray's *Cases on Property*, Vols. II and III, (2nd edition). I; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	10	4	—	—	2	2	2	2	—	—	Carpenter

11. **Agency.**—Wambaugh's *Cases on Agency*. I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	11	3	—	9	9	—	9	—	—	204	Carpenter

12a-12b. **Equity.**—Ames' *Cases on Equity*. I; (3); II; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	12a	3	—	10	10	10	—	—	—	—	Pomeroy

SECOND SEMESTER

Law	12b	2	—	—	2	2	—	—	—	—	Pomeroy
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13. **Damages.**—Beale's *Cases on Damages*, (2nd edition). I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	13	2	—	—	—	—	11	11	—	—	Decker

*All courses are given in the Law building.

Law

14. Carriers.—Green's *Cases on Carriers*. II; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	14	3	—	—	—	10	10	10	—	—	Green

15. Bills and Notes.—Huffcut's *Cases on Bills and Notes*, (Colson's edition). I; (4).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	15	4	—	—	3	3	3	3	—	—	Vernier

16. Trusts.—Ames' *Cases on Trusts*, (2nd edition). II; (3).

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Law	16	3	—	8	8	8	—	—	—	201	Vernier

18. Wills.—Gray's *Cases on Property*, Vol. IV, (2nd edition). II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	18	2	—	—	—	—	2	2	—	204	Pomeroy

19. Partnership.—Mechem's *Cases on Partnership*, (2nd edition). II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	19	2	—	—	—	—	8	8	—	—	Hale

20. Equity Pleading.—Rush's *Cases on Equity Pleading*; selected Illinois and Federal Cases. II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	20	2	—	10	10	—	—	—	—	204	Harker

24. Municipal Corporations.—Beale's *Cases on Municipal Corporations*. II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	24	2	—	—	—	—	10	10	—	201	Pomeroy

27. Future Interests in Property.—Gray's *Cases on Property*, Vol. V and part of Vol. VI, (2nd edition). II; (3).

NOTE: Given in 1915-16 and in alternate years.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	27	3	—	—	—	11	11	11	—	204	Carpenter

28. Insurance.—Wambaugh's *Cases on Insurance*. I; (2).

NOTE: Given in 1915-16 and in alternate years.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	28	2	—	—	—	—	10	10	—	204	Green

[29. Conveyancing.—Gray's *Cases on Property*, Vol III and part of Vol. VI, (2nd edition). (Incorporated in Law 10).]

30. Public International Law.—Lawrence's *Principles of International Law* and Scott's *Cases on International Law*. I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	30	3	—	—	—	—	—	—	—	—	Garner

(to be announced)

[32. Quasi-Contracts.—Woodruff's *Cases on Quasi-Contracts*. II; (2). Given in alternate years. Not given in 1915-1916.]

[34. Public Utilities.—Wyman's *Cases on Public Service Companies*, (2nd edition). II; (2). Given in alternate years. Not given in 1915-16.]

35a. Brief Making.—Lectures and assigned work. I; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	35a	1	—	2	—	—	—	—	—	204	Decker

35b. Moot Court. II; (1).

Prerequisite: Law 4 and 35a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	35b	1	—	1-2	—	—	—	—	—	—	Harker

Third Year Courses

4a. Illinois Procedure.—I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	4a	3	—	11	11	11	—	—	—	201*	Harker

17. Private Corporations.—Canfield and Wormser's *Cases on Private Corporations*. II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	17	2	—	—	3	3	3	3	—	201	Green

21. Suretyship.—Ames' *Cases on Suretyship*. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	21	3	—	9	9	9	—	—	—	201	Decker

22. Constitutional Law.—Hall's *Cases on Constitutional Law*. I; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	22	3	—	8	8	8	—	—	—	201	Green

23. Mortgages and the Recording Acts.—Case book to announced later. I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	23	2	—	—	—	—	9	9	—	201	Pomero

25. Bankruptcy.—Williston's *Cases on Bankruptcy*. I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	25	2	—	—	—	2	2	—	—	201	Decker

*All courses are given in the Law building.

Library Science

31. Conflict of Laws.—Beale's *Shorter Selection of Cases on Conflict of Laws*. II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	31	2	—	11	11	—	—	—	—	201	Vernier

33. Constitutional Law.—Hall's *Cases on Constitutional Law*. II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	33	2	—	—	—	—	9	9	—	—	Green

36a-36b. Moot Court.—I, II; (2).

Prerequisite: Law 4, 20, and 35a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	36a	2	—	1-2	—	—	—	—	—	—	Harker

SECOND SEMESTER			
Law	36b	2	Schedule the same as for 36a (first semester).

LIBRARY SCIENCE

PHINEAS LAWRENCE WINDSOR, Ph.B., *Director*

FRANCES SIMPSON, M.L., B.L.S., *Assistant Director, Assistant Professor*

FLORENCE RISING CURTIS, A.B., B.L.S., *Associate*

ERNEST JAMES REECE, Ph.B., *Associate*

ETHEL BOND, A.B., B.L.S., *Instructor*

EDNA LYMAN SCOTT, *Special Lecturer*

EMMA FELSENTHAL, Ph.B., B.L.S., *Instructor, Reference Assistant*

FRANCIS KEESE WYNKOOP DRURY, A.M., B.L.S., *Lecturer, Order Work*

ALICE SARAH JOHNSON, A.B., B.L.S., *Lecturer, General Reference*

EMMA REED JUTTON, B.L.S., *Lecturer, Loans*

ADAH PATTON, B.L.S., *Lecturer, Cataloging*

MARGARET HUTCHINS, A.B., B.L.S., *Lecturer, General Reference*

2a-2b. Reference Work.—Methods of bibliographical research; the use of reference books; practical work in the reference department of the University library. I, II; (3).

				FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Library Science	2a	3	A	9	—	9	—	—	—	305 L.	Simpson	
			B	—	9	—	9	—	—	305 L.	Simpson	

SECOND SEMESTER				
Library Science	2b	3	—	Sections and schedule the same as for 2a (first semester).

3a-3b. Selection of Books.—Principles of selection for libraries of different types; standard lists, critical periodicals, and other aids; practise in writing book annotations. I, II; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	3a	2	—	—	8	—	8	—	—	305 L.	Felsenthal

SECOND SEMESTER

Library Science 3b 2 — Schedule the same as for 3a (first semester).

4a-4b. Practise Work.—Work in the various departments of the University library. To be taken with Library 2, 16, 17, 18, 19, 20, and 21. *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 4a	2	—	—	—	11	11	11	11	—	—	Reece

SECOND SEMESTER

Library Science 4b 2 — Schedule the same as for 4a (first semester).

6a-6b. Subject Bibliography.—Selection of books in special subjects; the literature and bibliography of each. Lectures given by professors in the respective departments of the University. *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 6a	2	—	—	—	11	—	11	—	—	309 L.	Windsor and others

SECOND SEMESTER

Library Science 6b 2 — Schedule the same as for 6a (first semester).

[7. History of Libraries.—The foundation, development, and resources of the leading libraries of Europe and the United States. *II; (2).* Given in alternate years. Not given in 1915-16.]

8. Advanced Reference.—Transactions of learned societies; special periodicals and government publications; indexes and other works of value to a large reference department. *I; (2).*

Prerequisite: Library 2a-2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 8	2	—	—	11	—	—	8	—	—	309 L.	Simpson

9. History of Books and Printing.—History of the early forms of books; the invention and spread of printing; book illustration; book-binding. *II; (2).* Given in alternate years. Given in 1915-16.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 9	2	—	—	—	—	2	—	2	—	305 L.	Windsor

10a-10b. Practise Work.—A continuation of Library 4a-4b, supplemented by one month of work as a member of the staff of an assigned public library. *I, II; (4).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 10a	4	—	—	—	—	—	—	—	—	(Arrange)	Curtis

SECOND SEMESTER

Library Science 10b	4	—	—	—	—	—	—	—	—	(Arrange)	Curtis
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12. General Reference.—Classification and arrangement of books in the University library; the card catalogs; the more generally used reference books. (Intended for freshmen and sophomores in the University, not for students in Library School.) Repeated each semester. *I or II; (2).*

Library Science

EITHER SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science 12	2	A	—	11	—	—	—	—	305 L.	Hutchins
		B	—	3	—	—	—	—	305 L.	Johnson
		C	—	—	3	—	—	—	305 L.	Felsenthal

13a-13b. Public Documents.—13a: Production and distribution of United States documents; their treatment and use as reference books. 13b: American state and municipal documents; publications of foreign governments. *I, II; (2).*

FIRST SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science 13a	2	—	—	—	11	—	11	—	309 L.	Reece

SECOND SEMESTER

Library Science 13b 2 — Schedule the same as for 13a (first semester).

15a-15b. Seminar in Library Economy.—Special problems; library economy publications. *I, II; (2).*

FIRST SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science 15a	2	—	8-10	—	—	—	—	—	309 L.	Simpson and others

SECOND SEMESTER

Library Science 15b 2 — Schedule the same as for 15a (first semester).

16. Order, Accession, and Shelf Work.—Order department records and routine; book-buying; publishers and discounts; copyright; serials and continuations; gifts; exchanges; duplicates; the accession book and its substitutes; the shelf list and its uses; the care of pamphlets, clippings, and maps. *I; (2).*

FIRST SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science 16	2	—	—	10	—	10	—	—	305 L.	Curtis

17. Classification.—Principles of book classification; the Dewey Decimal Classification; the Cutter Expansion Classification; book numbers. *I; (3).*

FIRST SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science 17	3	—	10	—	10	—	10	—	305 L.	Bond

18. Cataloging.—Dictionary cataloging; subject headings; classed cataloging. *I; (3).*

FIRST SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science 18	3	—	8	—	8	—	8	—	305 L.	Bond

19. Trade Bibliography.—Books and periodicals used as tools of the book trade of America, England, Germany, and France. *II; (1).*

SECOND SEMESTER

<i>Subject</i>	<i>No. Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science 19	1	—	—	10	—	—	—	—	305 L.	Reece

20. Loan Department.—Records connected with the loan of books; representative loan systems; rules, regulations, and practises. *II*; (1).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	20	1	—	—	—	—	10	—	—	305 L.	Jutton

21. Printing, Binding, and Indexing.—*Printing*: Printing for libraries; preparing copy and reading proof. *Binding*: Materials and methods of book-binding for libraries; practise in preparing books for the bindery and in making necessary records. *Indexing*: Indexes; the form of citation; the choice and arrangements of headings; kind of type. *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	21	2	—	—	—	11	—	11	—	305 L.	Windsor Curtis

22. Library Extension.—Methods; library associations; library schools; library commissions; township and county library systems; traveling libraries; home libraries; other agencies. *II*; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	22	3	—	10	—	10	—	10	—	305 L.	Curtis

23a-23b. Library Administration and Current Library Literature.—Current library periodicals, bulletins, reports, catalogs, and reading lists; the organization, reorganization, and administration of small libraries; the planning and equipment of reading rooms and small library buildings; library accounts and business forms. *I, II*; (1).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	23a	1	—	11	—	—	—	—	—	305 L.	Curtis

SECOND SEMESTER											
Library Science	23b	1	—	Schedule the same as for 23a (first semester).							

24a-24b. Selection of Books.—English translations of representative works of French, German, Spanish, Italian, and Russian novelists of the 19th century; examination of about forty newly published books. *I, II*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	24a	2	—	—	9	—	9	—	—	309 L.	Drury

SECOND SEMESTER											
Library Science	24b	2	—	Schedule the same as for 24a (first semester).							

25. Advanced Classification and Cataloging.—Systems of book classification; rules for cataloging books. *II*; (1).

Prerequisite: Library 17, 18.

Mathematics

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science	25	1	—	—	—	—	10	—	—	309 L.	Bond

26a-26b. Library Administration.—Advanced order work; library organization; library architecture; legislative and municipal reference work; library work with children; special topics. *I, II; (3).*

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science	26a	3	—	10	—	10	—	10	—	—	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Simpson Drury Scott Reece </div> </div>

SECOND SEMESTER

Library Science 26b 3 — Schedule the same as for 26a (first semester).

27. Bibliographical Institutions.—Organization and work of bibliographical societies and institutions of America and Europe; co-operative bibliographical undertakings; international bibliography. *I; (1).*

FIRST SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science	27	1	—	—	—	—	10	—	—	309 L.	Patton

28. Practise Work.—Advanced practise work in certain departments of the University library. *II; *(1 to 4). Time to be arranged.*

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Library Science	28	*1 to 4	—							(Arrange)	—

MATHEMATICS

EDGAR JEROME TOWNSEND, Ph.D., LL.D., *Professor*

GEORGE ABRAM MILLER, Ph.D., *Professor*

HENRY LEWIS RIETZ, Ph.D., *Professor*

JAMES BYRNIE SHAW, D.Sc., *Associate Professor*

CHARLES HIRSCHER SISAM, Ph.D., *Assistant Professor*

ARNOLD EMCH, Ph.D., *Assistant Professor*

ROBERT D CARMICHAEL, Ph.D., *Assistant Professor*

ARTHUR ROBERT CRATHORNE, Ph.D., *Associate*

ROBERT LACY BORGER, Ph.D., *Associate*

ERNEST BARNES LYTLE, Ph.D., *Associate*

GUSTAF ERIC WAHLIN, Ph.D., *Associate*

AUBREY JOHN KEMPNER, Ph.D., *Associate*

WILLIAM WELLS DENTON, Ph.D., *Instructor*

EDWARD WILSON CHITTENDEN, Ph.D., *Instructor*

LEVI THOMAS WILSON, Ph.D., *Instructor*

GUY WATSON SMITH, M.S., *Assistant*

WILLIAM HAROLD WILSON, A.M., *Assistant*

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 5.

ROBERT HASKELL MARSHALL, A.B., *Assistant*
 HOBART D FRARY, M.S., *Assistant*
 RAYMOND FRANKLIN BORDEN, A.M., *Assistant*
 JOHN SHERMAN BEEKLEY, A.B., *Graduate Assistant*
 CHARLES FRANCIS GREEN, A.B., *Graduate Assistant*

Major: Twenty hours made up from any undergraduate courses offered by the department, except Mathematics 2, 4, and 8, and including Mathematics 7 and 9.

Minors: Twenty hours selected from physics, chemistry, and astronomy.

2. College Algebra.—I or II; (3).

Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	2	3	*A 1	8	—	8	—	8	—	418 N. H.	Carmichael
			*A 2	8	—	8	—	8	—	419 N. H.	Chittenden
			*A 3	8	—	8	—	8	—	422 N. H.	Wilson, L. T.
			*A 4	8	—	8	—	8	—	423 N. H.	—
			*B 1	9	—	9	—	9	—	432 N. H.	Kempner
			*B 2	9	—	9	—	9	—	423 N. H.	Borger
			*B 3	9	—	9	—	9	—	422 N. H.	Wilson, L. T.
			*B 4	9	—	9	—	9	—	419 N. H.	Smith
			*D 1	11	—	11	—	11	—	422 N. H.	Sisam
			*D 2	11	—	11	—	11	—	434 N. H.	Borden
			*D 3	11	—	11	—	11	—	432 N. H.	Kempner
			*D 4	11	—	11	—	11	—	425 N. H.	Marshall
			*E 1	1	—	1	—	1	—	425 N. H.	Denton
			*E 2	1	—	1	—	1	—	418 N. H.	Wilson, W. H.
			*E 3	1	—	1	—	1	—	420 N. H.	Frary
			*E 4	1	—	1	—	1	—	434 N. H.	Borden
			*F 1	2	—	2	—	2	—	425 N. H.	Denton
			*F 2	2	—	2	—	2	—	419 N. H.	Chittenden
			S 1	9	—	9	—	9	—	420 N. H.	Reed
			S 2	9	—	9	—	9	—	434 N. H.	Lytle
			S 3	9	—	9	—	9	—	418 N. H.	—
			T 1	10	—	10	—	10	—	432 N. H.	Marshall
			T 2	10	—	10	—	10	—	420 N. H.	Reed
			W 1	2	—	2	—	2	—	418 N. H.	Wilson, W. H.
			W 2	2	—	2	—	2	—	420 N. H.	Frary
			X 1	3	—	3	—	3	—	423 N. H.	Wahlin
SECOND SEMESTER†											
			B 1	9	—	9	—	9	—	418 N. H.	Carmichael
			D 1	11	—	11	—	11	—	418 N. H.	Miller
			D 2	11	—	11	—	11	—	432 N. H.	Kempner
			G 1	3	—	3	—	3	—	425 N. H.	Denton

*Open to engineers only.

†Provided primarily for those who fail the first semester.

Mathematics

4. Plane Trigonometry.—I or II; (2).

Prerequisite: Entrance algebra, $1\frac{1}{2}$ units; plane geometry, 1 unit.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Mathematics	4	2	*A 1	—	8	—	8	—	—	418 N. H.	Carmichael
			*A 2	—	8	—	8	—	—	419 N. H.	Chittenden
			*A 3	—	8	—	8	—	—	422 N. H.	Wilson, L. T.
			*A 4	—	8	—	8	—	—	423 N. H.	—
			*B 1	—	9	—	9	—	—	432 N. H.	Kempner
			*B 2	—	9	—	9	—	—	423 N. H.	Borger
			*B 3	—	9	—	9	—	—	422 N. H.	Wilson, L. T.
			*B 4	—	9	—	9	—	—	419 N. H.	Smith
			*D 1	—	11	—	11	—	—	422 N. H.	Miller
			*D 2	—	11	—	11	—	—	434 N. H.	Borden
			*D 3	—	11	—	11	—	—	432 N. H.	Kempner
			*D 4	—	11	—	11	—	—	425 N. H.	Marshall
			*E 1	—	1	—	1	—	—	425 N. H.	Denton
			*E 2	—	1	—	1	—	—	418 N. H.	Wilson, W. H.
			*E 3	—	1	—	1	—	—	420 N. H.	Frary
			*E 4	—	1	—	1	—	—	434 N. H.	Borden
			*F 1	—	2	—	2	—	—	425 N. H.	Denton
			*F 2	—	2	—	2	—	—	419 N. H.	Chittenden
			S 1	—	9	—	9	—	—	420 N. H.	Reed
			S 2	—	9	—	9	—	—	434 N. H.	Lytle
			S 3	—	9	—	9	—	—	418 N. H.	—
			T 1	—	10	—	10	—	—	432 N. H.	Marshall
			T 2	—	10	—	10	—	—	420 N. H.	Reed
			U 1	—	11	—	11	—	—	431 N. H.	Emch
			W 1	—	2	—	2	—	—	418 N. H.	Wilson, W. H.
			W 2	—	2	—	2	—	—	420 N. H.	Frary
			X 1	—	3	—	3	—	—	423 N. H.	Wahlin

SECOND SEMESTER†

B 1	—	9	—	9	—	—	418 N. H.	Carmichael
D 1	—	11	—	11	—	—	434 N. H.	Lytle
D 2	—	11	—	11	—	—	432 N. H.	Kempner
G 1	—	3	—	3	—	—	419 N. H.	Chittenden

5. Teachers' Course.—Secondary algebra and geometry; their educational value; position in course; methods of teaching; correlation; comparison of American methods with those of foreign countries; order and importance of topics; text-books; literature. Lectures; discussions; reports. I; (2).

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	5	2	—	—	11	—	11	—	—	435 N. H.	Lytle

*Open to engineers only.

†Provided primarily for those who fail the first semester.

6. Analytic Geometry.—Plane and solid analytic geometry. *II*; (5).

Prerequisite: Mathematics 2, 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	6	5	*A 1	8	8	8	8	8	—	423 N. H.	Wahlin
			*A 2	8	8	8	8	8	—	422 N. H.	Wilson, L. T.
			*A 3	8	8	8	8	8	—	434 N. H.	Marshall
			*A 4	8	8	8	8	8	—	419 N. H.	Frery
			*B 1	9	9	9	9	9	—	432 N. H.	Kempner
			*B 2	9	9	9	9	9	—	423 N. H.	Borger
			*B 3	9	9	9	9	9	—	420 N. H.	Crathorne
			*B 4	9	9	9	9	9	—	419 N. H.	Shaw
			*D 1	11	11	11	11	11	—	422 N. H.	Sisam
			*D 2	11	11	11	11	11	—	423 N. H.	Borger
			*E 1	1	1	1	1	1	—	422 N. H.	Borden
			*E 2	1	1	1	1	1	—	418 N. H.	Wilson, W. H.
			*E 3	1	1	1	1	1	—	420 N. H.	Frery
			*F 1	2	2	2	2	2	—	419 N. H.	Chittenden
			*F 2	2	2	2	2	2	—	425 N. H.	Denton
			*F 3	2	2	2	2	2	—	432 N. H.	Marshall
			S 1	9	9	9	9	9	—	425 N. H.	Smith
			S 2	9	9	9	9	9	—	434 N. H.	Lytle
			T 1	10	10	10	10	10	—	420 N. H.	Reed
			T 2	10	10	10	10	10	—	422 N. H.	Wilson, L. T.
			T 3	10	10	10	10	10	—	425 N. H.	—
			W 1	2	2	2	2	2	—	418 N. H.	Wilson, W. H.
			W 2	2	2	2	2	2	—	422 N. H.	Borden

7-9. Differential and Integral Calculus.—The principles developed and applied to functions of one and of several variables. (Section A1 is an honor section and may be selected by those specializing in mathematics or having an average grade of 90 in freshman mathematics). *I*; (5); *II*; (3).

NOTE: Two sections of Mathematics 7 are given the second semester.

Prerequisite: Mathematics 6.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	7	5	*A 1	8	8	8	8	8	—	425 N. H.	Rietz
			A 2	8	8	8	8	8	—	431 N. H.	Emch
			A 3	8	8	8	8	8	—	420 N. H.	Crathorne
			A 4	8	8	8	8	8	—	434 N. H.	Lytle
			A 5	8	8	8	8	8	—	432 N. H.	Kempner
			C 1	10	10	10	10	10	—	434 N. H.	Townsend
			C 2	10	10	10	10	10	—	422 N. H.	Sisam
			C 3	10	10	10	10	10	—	419 N. H.	Shaw
			C 4	10	10	10	10	10	—	431 N. H.	Carmichael
			C 5	10	10	10	10	10	—	423 N. H.	Borger
			E 1	1	1	1	1	1	—	423 N. H.	Wahlin
			E 2	1	1	1	1	1	—	419 N. H.	Chittenden
SECOND SEMESTER†											
			E 1	1	1	1	1	—	419 N. H.	Chittenden	
			E 2	1	1	1	1	—	432 N. H.	Smith	

*Honor section. See conditions given in description of course.

†Provided primarily for those who fail the first semester.

Mathematics

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	9	3	*A 1	8	—	8	—	8	—	425 N. H.	Rietz
			A 2	8	—	8	—	8	—	432 N. H.	Kempner
			A 3	8	—	8	—	8	—	420 N. H.	Crathorne
			A 4	—	8	—	8	—	8	431 N. H.	Emch
			A 5	—	8	—	8	—	8	418 N. H.	Carmichael
			A 6	—	8	—	8	—	8	425 N. H.	Denton
			B 1	—	9	—	9	—	9	431 N. H.	Emch
			B 2	—	9	—	9	—	9	422 N. H.	Wilson, L. T.
			C 1	10	—	10	—	10	—	434 N. H.	Townsend
			C 2	10	—	10	—	10	—	419 N. H.	Shaw
			C 3	10	—	10	—	10	—	423 N. H.	Borger
			E 1	1	—	1	—	1	—	423 N. H.	Wahlin

8. Differential and Integral Calculus.—(For students in chemistry and chemical engineering). *I*; (5).

Prerequisite: Mathematics 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	8	5	C 1	10	10	10	10	10	—	418 N. H.	Miller
			D 1	11	11	11	11	11	—	418 N. H.	Wilson L. T.
			D 2	11	11	11	11	11	—	420 N. H.	Smith

9a. Differential and Integral Calculus.—(Second Course). The definite (single and multiple) integral; the formation of problems in applied mathematics; line, surface, and volume integrals; the theorem of Stokes and Green; partial differentiation; exact integrals with applications of the conditions for exactness; elements of differential equations, approximate quadrature and integration of differential equations. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	9a	2	B 1	9	—	9	—	—	—	425 N. H.	Denton
			C 1	—	10	—	10	—	—	425 N. H.	Denton
			C 2	—	10	—	10	—	—	420 N. H.	Crathorne
			D 1	—	11	—	11	—	—	419 N. H.	Shaw
			D 2	—	11	—	11	—	—	423 N. H.	Borger

10. Theory of Equations and Determinants.—Fundamental properties of an algebraic equation in one unknown; the solutions of systems of simultaneous equations; theory of a system of linear equations; some fundamental properties of determinants. *II*; (3).

Prerequisite: Mathematics, 6, 7, 9 (or 8).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	10	3	—	10	—	10	—	10	—	418 N. H.	Miller

16-17. Differential Equations and Advanced Calculus.—Ordinary and partial differential equations; special topics of calculus of value in the application of mathematics. *I, II*; (3).

Prerequisite: Mathematics 7 and 9, (or 8).

*Honor section. See conditions given in description of course, page 239.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	16	3	—	2	—	2	—	2	—	434 N. H.	Townsend

SECOND SEMESTER

Mathematics 17 3 — Schedule the same as for 16 (first semester).

18. Constructive Geometry.—Development and training of space perception; properties of lines, planes, and the simpler surfaces of the second order studied by methods of parallel and central projection; graphical interpretation of the processes of analytic geometry; analytic discussion of the methods of descriptive geometry. *I*; (3).

Prerequisite: Mathematics 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	18	3	—	9	—	9	—	9	—	431 N. H.	Emch

19. Solid Analytic Geometry.—Equations of the plane and right line in space; properties of surfaces of the second degree; the classification and special properties of quadrics; the theory of surfaces. *II*; (3).

Prerequisite: Mathematics 7, 9 (or 8), and 10.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	19	3	—	9	—	9	—	9	—	422 N. H.	Sisam

21. Method of Least Squares.—Law of probability and error; adjustment of observations; precision of observation; independent and conditional observations. *I*; (2).

Prerequisite: Mathematics 7, 9 (or 8).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	21	2	—	—	2	—	2	—	—	Obs.	Stebbins

23. Averages and Mathematics of Investment.—Meaning, use, and abuse of different kinds of averages; their relation to the theory of probability; application of the elements of probability to annuities, insurance, and branches of science; loans and investments; problems in the evaluation of investment securities. *II*; (3).

Prerequisite: Mathematics 2; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	23	2	—	9	—	9	—	9	—	312 T. B.	Rietz

24-25. Functions of a Complex Variable.—*I, II*; (3).

Prerequisite: Mathematics 7, 9, 16-17.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	24	3	—	3	—	3	—	3	—	435 N. H.	Townsend

SECOND SEMESTER

Mathematics 25 3 — Schedule the same as for 24 (first semester).

Mathematics

27-28. Projective Geometry.—Fundamental concepts; anharmonic ratio; projective pencils and ranges; transformations and groups; theory of conics and quadric surfaces; pencils and ranges of conics; quadratic transformations and projective theory of cubics; applications in mechanics. *I, II; (3).*

Prerequisite: Senior standing in mathematics.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Mathematics	27	3	—	9	—	9	—	9	—	431 N. H.	Emch

SECOND SEMESTER											
Mathematics	28	3	—	Schedule the same as for 27 (first semester).							

40. Fundamental Concepts of Mathematics.—The concepts of higher mathematics in their bearing on elementary mathematics. *II; (2).*

Prerequisite: Junior standing in mathematics.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Mathematics	40	2	—	—	—	11	—	11	—	434 N. H.	Lytle

Courses for Graduates

100. Seminar and Thesis.—*Three times a week; I, II; (1 or 2 units).*
Time to be arranged. Professor TOWNSEND

104. Expansions in Fundamental Functions.—Theory of integral equations; methods of expansion of arbitrary functions in terms of the characteristic functions of a given nucleus; applications of Green's functions, Potential functions, Fourier series, series of Legendrians, of Bessel functions; differential equations of physics under given boundary conditions; the inversion of definite integrals. *Three times a week; I, II; (1 unit).*

BOTH SEMESTERS											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Mathematics	104	1 unit	—	2	—	2	—	2	—	435 N. H.	Shaw

105. Calculus of Variations.—Those elements of the science most needed in the study of the higher subjects of mathematical astronomy and physics. *I, II; (1 unit).*

Prerequisite: Mathematics 16.

BOTH SEMESTERS											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Mathematics	105	1 unit	—	10	—	10	—	10	—	435 N. H.	Crathorne

110. Elliptic Functions.—Application to geometry and mechanics; the elliptic modular functions. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 24.

BOTH SEMESTERS											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Mathematics	110	1 unit	—	1	—	1	—	1	—	435 N. H.	Carmichael

121. Theory of Groups.—A second course in the theory of groups of finite order; a knowledge of the elements is essential. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 120.

Mechanical Engineering

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	121	1 unit	—	9	—	9	—	9	—	435 N. H.	Miller

124. Theory of Numbers.—Conferences; Kronecker's modular systems; quadratic residues and forms; algebraic numbers. *Three times a week; I, II; (1 unit).*

Prerequisite: Graduate standing in mathematics.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	124	1 unit	—	11	—	11	—	11	—	435 N. H.	Wahlin

129. Theory of Statistics.—Statistical investigation; application of the theory of probability to statistical data; fitting curves to observation; interpolation; theory of errors; mathematical theory of variability and correlation; application of principles developed to problems in economics, sociology, and biology. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 8.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	129	1 unit	—	—	9	—	9	—	9	207 Com.	Reitz

135. Metric Differential Geometry.—Application of the calculus to the theory of curves and surfaces based on the use of Cartesian co-ordinates; relation of the theory of surfaces to the theory of invariants of a pair of quadratic differential forms. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 16.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	135	1 unit	—	8	—	8	—	8	—	435 N. H.	Sisam

MECHANICAL ENGINEERING

CHARLES RUSS RICHARDS, M.M.E., *Professor*

GEORGE ALFRED GOODENOUGH, M.E., *Professor, Thermodynamics*

BRUCE WILLET BENEDICT, B.S., *Director, Shop Laboratories*

LEWIS ALLEN HARDING, M.E., *Professor, Experimental Mechanical Engineering*

OSCAR ADOLPH LEUTWILER, M.E., *Professor, Machine Design*

ARTHUR CUTTS WILLARD, B.S., *Assistant Professor, Heating and Ventilation*

JOHN ADLUM DENT, M.E., *Associate*

GEORGE BENJAMIN RICE, *Lecturer on the Installation and Operation of Mechanical Equipment for Buildings, and Assistant Mechanical Engineer in the Office of the Supervising Architect*

ALONZO PLUMSTED KRATZ, M.S., *Research Associate, Engineering Experiment Station*

HARRY FREDERICK GODEKE, B.S., *Instructor*

EDWIN FRANK, B.S., *Instructor*

HARRY WILLIAM WATERFALL, B.S., *Instructor, Machine Design*

HORATIO SPRAGUE McDEWELL, M.M.E., *Instructor*

EDGAR THOMAS LANHAM, *Instructor, Forge Practise*

Mechanical Engineering

ROBERT EDWIN KENNEDY, *Instructor, Foundry Practise*

GUSTAVE ADOLPH GROSS, *Instructor, Pattern Making*

GUSTAV HOWARD RADEBAUGH, *Instructor, Machine Practise*

JAMES HARVEY HOGUE, *Instructor, Foundry Practise*

JEREMIAH AMOS DE TURK, *Instructor, Machine Practise*

LEROY ALONZO WILSON, M.M.E., *First Assistant, Engineering Experiment Station*

JAMES MERION DUNCAN, *Assistant, Pattern Making*

PETER JOSEPH REBMAN, *Assistant, Forge Practise*

JOHN ALEXANDER FRISK, *Assistant and Mechanician*

1. Steam and Air Machinery.—The construction, operation and care of boilers, engines, and air compressors; elementary thermodynamics; steam engine performance; transmission of compressed air and its applications. (For students in civil and mining engineering.) *I*; (3).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	1	3	E F	2	—	2	—	2	—	308 E. H.	—
			G H	—	8	—	8	—	8	305 E. H.	—
			O U	—	10	—	10	—	10	305 E. H.	—
			Z	8	—	8	—	8	—	305 E. H.	—

2. Steam Engineering.—Engines, boilers, pumps, condensers, and other steam machinery. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	2	3	K V	—	11	—	11	—	11	305 E. H.	—
			L	9	—	9	—	9	—	202 E. H.	—
			M	—	10	—	10	—	10	305 E. H.	—
			N	8	—	8	—	8	—	308 E. H.	—
			T	11	—	11	—	11	—	202 L. A. M.	—

11. Thermodynamics and Heat Engines.—(For students in electrical engineering.) *I*; (3).

Prerequisite: Mechanical Engineering 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	11	3	K M V	10	—	10	—	10	—	308 E. H.	—
			L N	11	—	11	—	11	—	308 E. H.	—

12. Thermodynamics.—The transformation of heat into work; the second law and its connection with irreversible processes; the properties of heat media; the perfect gases; saturated and superheated vapors; the flow of fluids. *II*; (5).

Prerequisite: Mathematics 9a; Theoretical and Applied Mechanics 27.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	12	5	P W	9	9	9	9	9	—	308 E. H.	—
			Q	11	11	11	11	11	—	308 E. H.	—

Mechanical Engineering

15. Gas Power Engineering.—Internal combustion engines; liquid and gaseous fuels and their combustion; gas producers. *I*; (3).

Prerequisite: Mechanical Engineering 12.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	15	3	P Q	10	—	10	—	10	—	305 E. H.	—

23. Mechanical Equipment of Buildings.—Lecture and laboratory course; theory and practise of designing simple systems for the mechanical equipment of buildings, including heating and ventilation, refrigeration, fire protection, vacuum cleaning, elevators, lighting, and small power plants. *I*; (5).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	23	5	C	11	—	11	—	11	8-12	M. L.	—
			D	11	8-11	11	—	11	11	M. L.	—

25. Heating and Ventilation for Architects.—The theory and the application of the principles of heating and ventilation to modern practise. Direct and indirect steam and hot water heating; furnace heating; ventilation and air analysis; air condition; temperature and humidity control. *I*; (2).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	25	2	A	—	11	—	11	—	—	M. L.	—

26. Heating and Ventilation.—The theory and the application of the principles of heating and ventilation to modern practise. Steam boilers and water heaters of steel and cast iron for heating service; heat losses from buildings; direct and indirect steam and hot water heating, using gravity systems; furnace heating; fan blast or mechanical indirect systems; exhaust steam heating; district heating by steam and water; ventilation and air analysis; air conditioning; temperature and humidity control. *II*; (3).

Prerequisite: Mechanical Engineering 65.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	26	3	P	10	—	10	—	10	—	M. L.	—
			Q	11	—	11	—	11	—	M. L.	—

30. Mechanics of Machinery.—Mechanisms and mechanical movements; cams, gears, valve gears, and quick-return motions; graphical constructions for displacement, velocity, and acceleration; kinetics of the steam engine mechanism and similar mechanisms; balancing; critical speeds; force and mass reduction. *II*; (5).

Prerequisite: Theoretical and Applied Mechanics 27.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	30	5	P	10	10-12	10	10-12	10	—	308 E. H.	—
			Q	9	8-10	9	8-10	9	—	305 E. H.	—

Mechanical Engineering

32. Power Transmission.—Shafting, belts, ropes, cables, water, air, gas, and steam as power transmitters; the measurement and storage of power. *II*; (3).

Prerequisite: Mechanical Engineering 12 and 43.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	32	3	P	11	—	11	—	11	—	305 E. H.	—
			Q	10	—	10	—	10	—	305 E. H.	—

37. Principles of Management.—Industrial development; modern industrial tendencies; principles of organization; selection and compensation of labor; application of science to industrial problems; practical shop systems of management; production. *I*; (3).

Prerequisite: Mechanical Engineering, 81, 82.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	37	3	P Q W	11	—	11	—	11	—	305 E. H.	—

43. Engineering Design.—Theory of machine design, with application; investigation of actual machines similar to the one to be designed; design of machinery subjected to heavy and variable stresses; punches, shears, presses, riveters, and cranes. *I*; (5).

Prerequisite: Theoretical and Applied Mechanics 29; Mechanical Engineering 30.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	43	5	P	1-4	11	1-4	11	1-4	—	305 E. H.	—
										308 E. H.	—
			Q	1-4	1	1-4	1	1-4	—	309 E. H.	—
										312 E. H.	—

44. Engineering Design.—Design and commercial application of special tools, fixtures, jigs, dies, and gauges used in modern high production manufacturing. *II*; (2).

Prerequisite: Mechanical Engineering 37 and 43.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	44	2	P Q	—	8-11	—	8-11	—	—	309 E. H.	—

52. Power Plant Design.—Study and design of some form of steam power plant. *II*; (3).

Prerequisite: Mechanical Engineering 43 and 65.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	52	3	P Q	1-4	—	1-4	—	1-4	—	309 E. H.	—

54. Industrial Plant Design.—Design and equipment of industrial plants. Design of buildings, heating, ventilation, lighting, power generation, and transmission; drying processes, etc. *II*; (3).

Prerequisite: Mechanical Engineering 43 and 65.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	54	3	P Q	1-4	—	1-4	—	1-4	—	312 E. H.	—

Mechanical Engineering

61. Power Measurement.—The testing and calibration of instruments and apparatus; use of the indicator; calculation of horse-power and steam consumption; reading of indicator diagrams; valve setting. (For students in electrical engineering.) *I*; (2).

Prerequisite: Mechanical Engineering 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	61	2	K M	—	—	1-4	—	—	8-11	M. L.	—
			L N V	1-4	—	—	—	1-4	—	M. L.	—
			T	—	1-4	—	1-4	—	—	M. L.	—

62. Power Measurement and Steam Engines.—Laboratory work, substantially the same as that given in M.E. 61, supplemented by lectures on steam machinery. *II*; (3).

Prerequisite: Junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	62	3	X	—	8-11	—	8-11	—	8	M. L.	—

64. Power Measurement.—Apparatus for engine and boiler tests—scales, thermometers, indicators, brakes and dynamometers, gauges, calorimeters; methods of calibrating and using such apparatus; tests for horse-power of steam engines, pumps, and gas engines. Reports. *II*; (3).

Prerequisite: Mechanical Engineering 2; registration in M.E. 12 or Chemistry 31.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	64	3	P W Z	1-5	—	—	—	1-5	—	M. L.	—
			Q	—	1-5	—	1-5	—	—	M. L.	—

65. Power Laboratory.—Experiments on engines, turbines, gas engines, pumps, boilers, injectors, air compressors, hoisting appliances, heating apparatus, and the refrigerating machines. *I*; (3).

Prerequisite: Mechanical Engineering 12 and 64.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	65	3	P	—	1-5	—	1-5	—	—	M. L.	—
			Q	—	8-12	—	8-12	—	—	M. L.	—

66. Power Laboratory.—Special research work in the mechanical engineering laboratory. Open to seniors only. *II*; (2).

Prerequisite: Mechanical Engineering 65; senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	66	2	P O	—	8-11	—	8-11	—	—	M. L.	—

71. Forge Work for Agricultural Students.—Forging and welding; tempering tools; pointing and hardening cultivator shovels, plow shares. *Six hours a week, either half of I or II*; (1). *Time to be arranged.*

73. Wood Work for Agricultural Students.—Carpentry for the farmer; use of tools; layout and construction of building joints; repairs to buildings

Mechanical Engineering

and equipment. *Six hours a week, either half of I or II; (1). Time to be arranged.*

75. Forge Work.—(9 weeks.) Hand and power forging and welding of metals; heat treatment of carbon and high speed steels in modern gas, electric, and cyanide furnaces; case carbonizing. *I or II; (1).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	75	1	P Q	1-4	—	1-3	—	1-4	—	M. S.	—

77. Foundry Work.—(9 weeks.) Modern foundry practise; bench, floor, and machine moulding; all branches of core making; operation of cupola and brass furnace; casting of iron, brass, and alloys. *I or II; (2).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	77	2	P Q	1-4	—	1-3	—	1-4	—	M. S.	—

79. Pattern Work.—(18 weeks.) Hand and machine methods in the production of useful patterns. *I or II; (3).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	79	3	P Q	1-4	—	1-3	—	1-4	—	W. S.	—

81. Machine Work.—Modern manufacturing methods; machine operation; shop management; organization; production methods; dispatching work; ordering, storing, and routing materials; time studies; shop accounting; inspection and all activities of the machine department of a manufacturing plant. *I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	81	3	K L	—	8-11	—	8-11	—	8-10	M. S.	—
			M N	—	1-4	—	1-4	—	10-12	M. S.	—

82. Machine Work.—(Continuation of 81). *II; (2).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	82	2	P	—	8-11	—	8-11	—	8-10	M. S.	—
			Q	—	1-4	—	1-4	—	10-12	M. S.	—

99. Thesis.—Investigation of special subject and preparation of thesis embodying a review of the literature of the subject, the results of investigation, and a discussion of those results. *II; (3). Time to be arranged.*

Courses for Graduates

Entrance upon graduate work in mechanical engineering presupposes the full undergraduate course in that subject.

106. Heat Motors.—The internal combustion motor; steam turbine. Principles and methods of refrigeration. *Twice a week; (1 unit). Time to be arranged.*

Mechanics, Theoretical and Applied

107. Thermodynamics.—Thermodynamics; their application to the solution of physical and engineering problems. *Twice a week; I; (1 unit). Time to be arranged.*

109. Machine Design.—Rational design; the application of mechanics of materials. Individual problems. *Twice a week; I or II; (1 unit). Time to be arranged.*

112. Laboratory Investigation.—Combustion of fuel; boiler economy; steam engines and turbines; gas engines and producers; properties of explosive mixtures; mechanical refrigeration. Original work. *Three times a week; I, II; (1½ units). Time to be arranged.*

114. Dynamics of Machinery.—Advanced problems. Balancing; whirling and vibration of shafts; theory of governors; fly wheels; force and mass reduction; stresses in rotating masses. *Twice a week; I, II; (1 unit). Time to be arranged.*

MECHANICS, THEORETICAL AND APPLIED

ARTHUR NEWELL TALBOT, C.E., D.Sc., *Professor, Municipal and Sanitary Engineering; in charge of Theoretical and Applied Mechanics*

HERBERT FISHER MOORE, M.M.E., *Professor*

MELVIN LORENIUS ENGER, C.E., *Assistant Professor*

VIRGIL R FLEMING, B.S., *Associate*

FRED B SEELY, M.S., *Associate*

GEORGE PAUL BOOMSLITER, M.S., *Associate*

NEWTON EDWARD ENSIGN, A.B., B.S., *Associate*

CLARENCE EUGENE NOERENBERG, A.B., A.E., *Instructor*

HARRY GARDNER, M.S., *Instructor*

ALEX VALLANCE, M.E., *Instructor*

WILLIAM JAMES PUTNAM, B.S., *Instructor*

1. Analytical Mechanics.—Especially designed for graduates and advanced undergraduates in Arts and Sciences. *I; (3).*

Prerequisite: Mathematics 8 or 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	1	3								—	Ensign

(Arrange)

2. Analytical Mechanics.—(A continuation of T. & A. M. 1.) *Lamb's Dynamics. II; (3).*

Prerequisite: Theoretical and Applied Mechanics 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	2	3									Ensign

(Arrange)

Mechanics, Theoretical and Applied

10. Hydraulics.—The pressure and flow of water; its utilization as motive power; observation and measurement of pressure, velocity, and flow; power and efficiency; determination of experimental coefficients. *Laboratory weekly; II; (3).*

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 21.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	10	3	E	—	1	—	1	—	—	208 E. H.	Enger and others
			Lab.	—	10-12	—	—	—	—		
			F	—	—	9	—	9	—	302 L. A. M.	
			Lab.	—	—	—	—	—	8-10		
			G	—	9	—	9	—	—	202 L. A. M.	
			Lab.	—	—	—	10-12	—	—		
			T	—	—	8	—	8	—	302 L. A. M.	
			Lab.	—	—	—	—	—	10-12		

14. Elements of Mechanics.—Kinematics, kinetics, and statics. (For architects and others who have not taken the calculus.) *II; (4).*

Prerequisite: Mathematics 2, 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	14	4	A	—	—	8	8	8	8	306 P. L.	Boomsiter and Gardner
			B	—	8	8	8	8	—	305 E. H.	
			D	—	1	1	1	1	—	302 L. A. M.	

15-16. Strength of Materials.—Graphical methods of determining the elastic curve of beams; centroids and moments of inertia of areas; reinforced concrete beams and columns; properties and tests of engineering materials. (For students in architecture and others without the prerequisites required for Theoretical and Applied Mechanics 29.) *Laboratory every other week. I, II; (3).*

Prerequisite: Theoretical and Applied Mechanics 14.

				FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor		
T. & A. M.	15	3	A	10	—	10	—	10-12	—	302 L. A. M.	Noeren- berg and others	}	
			B	—	10	—	10	—	10-12	302 L. A. M.			
			X	—	10	—	10	—	10-12	202 L. A. M.			
SECOND SEMESTER													
T. & A. M.	16	3	A	10	—	10	—	10-12	—	302 L. A. M.	Noeren- berg and others	}	
			B	—	10	—	10	—	10-12	302 L. A. M.			

20. Analytical Mechanics.—The mechanics of engineering rather than that of astronomy and physics. Fundamental concepts; equilibrium, centroids and center of gravity, friction; engineering problems; statement of conditions and use of data. *II; (3).*

Prerequisite: Mathematics 7; registration in Mathematics 9.

Mechanics, Theoretical and Applied

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	20	3	C	—	11	—	11	—	11	202 L. A. M.	Ensign and others
			D	—	11	—	11	—	11	202 E. H.	
			E	—	1	—	1	—	—	202 E. H.	
			F	8	—	8	—	8	—	202 L. A. M.	
			G	—	8	—	8	—	8	202 E. H.	
			K	—	9	—	9	—	9	302 L. A. M.	
			L	—	8	—	8	—	8	219 E. H.	
			M	—	10	—	10	—	10	202 L. A. M.	
			N	—	10	—	10	—	10	202 E. H.	
			P	10	—	10	—	10	—	202 E. H.	
			Q	10	—	10	—	10	—	422 E. H.	
			Y	10	—	10	—	10	—	206 T. B.	
			Z	10	—	10	—	10	—	215 T. B.	

21. Analytical Mechanics.—Continuation of Theoretical and Applied Mechanics 20. Kinematics and kinetics. *I*; (2).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	21	2	E	—	8	—	8	—	—	302 L. A. M.	Boom- slider and others
			F	—	8	—	8	—	—	306 P. L.	
			G	—	10	—	10	—	—	219 E. H.	
			H	—	9	—	9	—	—	302 L. A. M.	
			Z	—	10	—	10	—	—	202 E. H.	

25. Resistance of Materials.—A briefer course than Theoretical and Applied Mechanics 29. (For students in architectural, ceramic, chemical, electrical, and mining engineering.) *I*; (4).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	25	4	C	—	8	—	8	—	8	202 L. A. M.	Boom- slider and others
			Lab.	—	—	—	—	8-10	—	—	
			D	9	—	9	—	9	—	308 E. H.	
			Lab.	1-3	—	—	—	—	—	—	
			K	8	—	8	—	8	—	202 L. A. M.	
			Lab.	—	8-10	—	—	—	—	—	
			L	10	—	10	—	10	—	202 L. A. M.	
			Lab.	8-10	—	—	—	—	—	—	
			M	—	9	—	9	—	9	202 L. A. M.	
			Lab.	3-5	—	—	—	—	—	—	
			N	8	—	8	—	8	—	202 E. H.	
			Lab.	—	—	10-12	—	—	—	—	
			Z	10	—	10	—	10	—	202 E. H.	
			Lab.	—	—	—	—	—	8-10	—	

26. Analytical Mechanics and Hydraulics.—Kinematics, kinetics, and hydraulics; problems; experiments in the hydraulic laboratory. (For students in architectural engineering, electrical engineering, and mining engineering.) *Laboratory weekly during the last half of semester.* *II*; (4).

Prerequisite: Theoretical and Applied Mechanics 25.

Mechanics, Theoretical and Applied

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	26	4	C	—	8	—	8	—	8	202 L. A. M.	Seely and others
			Lab.	—	—	—	—	8-10	—	208 E. H.	
			D	9	—	9	—	9	—	202 L. A. M.	
			Lab.	1-3	—	—	—	—	—	202 L. A. M.	
			K	8	—	8	—	8	—	202 L. A. M.	
			Lab.	—	1-3	—	—	—	—	202 L. A. M.	
			L	10	—	10	—	10	—	202 L. A. M.	
			Lab.	—	—	—	1-3	—	—	202 L. A. M.	
			M	—	9	—	9	—	9	202 E. H.	
			Lab.	—	—	—	—	1-3	—	208 E. H.	
			N	—	8	—	8	—	8	302 L. A. M.	
			Lab.	—	—	10-12	—	—	—	208 P. L.	

27. Analytical Mechanics.—Kinetics and kinematics. A longer course than Theoretical and Applied Mechanics 21. (To be given to mechanical engineering students during the transition period of changing courses.) *I*; (3).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	27	3	P	9	—	9	—	9	—	202 L. A. M.	Enger and others
			Q	9	—	9	—	9	—	202 E. H.	
			Y	9	—	9	—	9	—	305 E. H.	

29. Resistance of Materials.—The mechanics of materials; the properties and requirements for materials of construction; the effect of methods of manufacture upon the quality of the material; specifications and standard tests; experiments and investigations in the materials laboratory. (For students in civil engineering, mechanical engineering, and municipal and sanitary engineering.) Recitations; lectures; assigned reading; laboratory weekly. *I*; (5).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20; registration in Theoretical and Applied Mechanics 21.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	29	5	*Lecture	—	—	11	—	—	—	100 Com.	Talbot and others
			E	8	—	8	—	8	—	302 L. A. M.	
			Lab.	—	—	—	10-12	—	—	—	
			F	8	—	8	—	8	—	306 P. L.	
			Lab.	—	10-12	—	—	—	—	—	
			G	10	—	10	—	10	—	219 E. H.	
			Lab.	—	—	1-3	—	—	—	—	
			H	9	—	9	—	9	—	302 L. A. M.	
			Lab.	10-12	—	—	—	—	—	—	
			P	—	8	—	8	—	8	308 E. H.	
			Lab.	—	—	—	3-5	—	—	—	
			Q	—	8	—	8	—	8	202 E. H.	
			Lab.	—	3-5	—	—	—	—	—	
			Y	—	8	—	8	—	8	302 P. L.	
			Lab.	—	1-3	—	—	—	—	—	

36. Analytical Mechanics.—The portion of T. & A. M. 26, which involves analytical mechanics. (Open only to railway electrical engineering students.) *II*; (2).

Prerequisite: Theoretical and Applied Mechanics 25.

*Each student taking the course must enroll in the lecture section.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	36	2	K	8	1-3	8	—	8	—	202 L. A. M	Vallance

Courses for Graduates

Entrance upon graduate work in theoretical and applied mechanics presupposes a full undergraduate course in that subject.

101. Analytical Mechanics.—Methods; problems and applications; critical and comparative study of texts. *Twice a week; I; (1 unit). Time to be arranged.*
Professor MOORE

102. Resistance of materials.—Properties of materials used in engineering construction and the methods of determining these properties; analysis and investigation in mechanics of materials; the effect of form of member in a structure or machine; the method of application of forces; comparative study of texts. *Twice a week; II; (1 unit). Time to be arranged.*
Professor MOORE

103. Hydraulics and Hydraulic Engineering.—The laws of hydraulics and their application to engineering problems; hydraulic power and its development; design and investigation. *Twice a week; II; (1 unit). Time to be arranged.*
Professor TALBOT

104. Experimental Work in the Laboratory of Applied Mechanics.—Investigation on materials and on their action as used in machines and structures; experiments with pumps, motors, and measuring devices; investigation of the laws of hydraulics, the development of power, and the study of various hydraulic problems. *Twice a week; I, II; ($\frac{1}{2}$ to 2 units). Time to be arranged.*
Professor MOORE

105. Experimental and Analytical Work in Reinforced Concrete.—Research: interpretation of available experimental results and their application to the design of structures; principles of construction. *Twice a week; I, II; ($\frac{1}{2}$ unit or more). Time to be arranged.*
Professor TALBOT

METEOROLOGY

(See under GEOLOGY.)

MILITARY SCIENCE

FRANK DANIEL WEBSTER, Major U. S. Infantry, *Professor and Commandant*
FREDERICK WILLIAM POST, 1st Sergeant, U. S. A., retired, *Administrative Assistant*

1. Theoretical Instruction.—Infantry Drill Regulations. For all freshmen men. *II; (1).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	1	1	A	11	—	—	—	—	—	—	Webster
			B	—	11	—	—	—	—	—	Webster
			C	—	—	11	—	—	—	—	Webster
			D	—	—	—	11	—	—	—	Webster
			E	—	—	—	—	11	—	—	Webster
			F	3	—	—	—	—	—	—	Webster
			G	—	3	—	—	—	—	—	Webster
			H	—	—	3	—	—	—	—	Webster
			I	—	—	—	3	—	—	—	Webster
			J	—	—	—	—	3	—	—	Webster

Military Science

2a-2b-2c-2d. Practical Instruction.—*Infantry.*—Infantry drill regulations; small-arm firing regulations; bayonet exercise; ceremonies. *Artillery.*—School of the Cannoneer and battery dismounted. *Signal Company.*—Flag; telegraph; wireless; heliograph. *Engineer Company.*—Field engineering; map reading; entrenchments; bridge building. *Hospital Company.*—U. S. Army Hospital Corps Drill Regulations. Freshmen and sophomore years. Two drill periods a week. *I, II; (1).*

FIRST SEMESTER (FRESHMEN)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	2a	1	(See Note)	4	4	4	4	—	—	Armory	Webster

SECOND SEMESTER (FRESHMEN)

Military	2b	1	(See Note)	4	4	4	4	—	—	Armory	Webster
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NOTE.—Freshmen must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions in the regiments will be made by the Commandant.

FIRST SEMESTER (SOPHOMORES)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	2c	1	(See Note)	4	4	4	4	—	—	Armory	Webster

SECOND SEMESTER (SOPHOMORES)

Military	2d	1	(See Note)	4	4	4	4	—	—	Armory	Webster
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NOTE.—Sophomores must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions in the regiments are made by the Commandant according to circumstances.

3a-3b. Theoretical Instruction.—For sophomores: Infantry drill regulations; small-arm firing regulations. For juniors and seniors: Field Service Regulations. This course is obligatory upon commissioned officers and sergeants, recommended to corporals, and open to others. *I, II; (No credit).*

Authorized Text-Books.—U. S. Army Infantry Drill Regulations; Army Regulations; Field Service Regulations; Guard Manual; Small-Arms Firing Regulations; Field Engineering (Beach); Hospital Drill Regulations; Manual of Military Training (Moss).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	3a		A (sophomores)	10	—	—	—	—	—	208 P. L.	Webster
			B (sophomores)	—	10	—	—	—	—	108 P. L.	Webster
			C (sophomores)	—	—	10	—	—	—	108 P. L.	Webster
			D (sophomores)	—	—	3	—	—	—	108 P. L.	Webster
			E (sophomores)	—	—	—	3	—	—	108 P. L.	Webster
			F (sophomores)	—	—	—	—	3	—	108 P. L.	Webster
			G (juniors)	—	—	—	10	—	—	108 P. L.	Webster
			H (juniors)	—	—	—	—	10	—	108 P. L.	Webster
			I (juniors)	—	3	—	—	—	—	108 P. L.	Webster
			J (seniors)	3	—	—	—	—	—	108 P. L.	Webster

SECOND SEMESTER

Military	3b	—	—	Schedule the same as for 3a (first semester).							
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MINERALOGY

(See GEOLOGY 5, 5a, 6, 7.)

MINING ENGINEERING

HARRY HARKNESS STOEK, B.S., E.M., *Professor*ELMER ALLEN HOLBROOK, B.S., *Assistant Professor*STEPHEN OSGOOD ANDROS, A.B., B.S., E.M., *Assistant Professor*ALFRED COPELAND CALLEN, B.S., E.M., *Instructor*

1. Earth and Rock Excavation.—Explosives; blasting; boring; tunneling; shaft-sinking; coal-cutting; timbering and prospecting. *Not regularly given in 1915-16 on account of change in course. May be given if sufficient number apply. Time to be arranged. I; (3).*

Mr. CALLEN

Prerequisite: Chemistry 1a or 1b.

3. Mining Principles.—Terminology; explosives; blasting; drilling; tunneling; shaft-sinking; mining and timbering of flat deposits. (For students in engineering courses other than mining.) *I; (2).*

Prerequisite: Chemistry 1a or 1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	3	2	—	8	—	8	—	—	—	206 T. B.	Callen

4. Mining Methods.—Mining and timbering of bedded, vein, and placer deposits. *II; (2).*

Prerequisite: Mining 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	4	2	—	—	8	—	8	—	—	206 T. B.	Stoek Andros

5. Mine Ventilation.—Mine gases; safety lamps; mine ventilation; lighting and signaling; explosions and mine fires; rescue work and first aid. Laboratory work. *I; (3).*

Prerequisite: Chemistry 1a or 1b, 4, Physics 1a-1b, 3a-3b, and Mining 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	5	3	—	9	—	—	—	8	—	206 T. B.	Stoek
			—	—	—	1,2,3	—	—	—	210 T. B.	Callen

6. Mechanical Engineering of Mines.—Hoisting: Ropes, cages, hoisting engines, and other appliances. Haulage: the different systems used underground and on the surface; the methods of loading and unloading; mine stables; transportation of workmen. Drainage of mines: mine dams, mine pumps. *II; (2).*

Prerequisite: Mechanical Engineering 1, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	6	2	—	—	8	—	8	—	—	206 T. B.	Callen

8. Mine Law, Administration, and Accounts.—Laws governing location, ownership, and policing of mines. Trade agreements, relations between employers and employees. Sociology of mining. Mine accounts and cost sheets. *II; (3).*

Prerequisite: Mining 3 or 4 or Geology 2.

Mining Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	8	3	—	8	—	8	—	8	—	206 T. B.	Stock
										207 T. B.	Holbrook

9. Preparation of Coal and Ores.—History, principles, processes, machines; applications to dry coal preparation and coal washing. Breaking, sizing, and concentrating ores. Laboratory practise in coal washing. *I*; (3).

Prerequisite: Chemistry 5 and Physics 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	9	3	—	—	—	10	—	10	—	206 T. B.	Holbrook
			—	1,2,3	—	—	—	—	—	Min. L.	

13. Utilization of Fuels.—The manufacture, handling, and utilization of wood, charcoal, peat, lignite, bituminous coal, anthracite, coke, petroleum, natural and artificial gas, and refractories in mining and metallurgical practise. *II*; (2).

Prerequisite: Junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	13	2	—	—	—	11	—	11	—	207 T. B.	Holbrook

15. Principles of Mine Ventilation.—Mine ventilation, signaling, and lighting. *I*; (2).

Prerequisite: Chemistry 4; Physics 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	15	1	—	10	—	—	—	—	—	206 T. B.	Callen

17. Problems.—Problems, library research, and reports on mining and metallurgical subjects. *I*; (1). *Time to be arranged.* Professor STOCK

19. Ore and Coal Preparation.—Principles and machines used in breaking, pulverizing, sizing, classifying, and concentrating ores and mineral products. Wet and dry concentration. Practical limits of ore dressing. Principles applied in coal preparation. Laboratory practise in ore concentration. *I*; (3).

Prerequisite: Chemistry 5; Geology 13a and 13b or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	19	3	—	—	—	10	—	10	—	206 T. B.	Holbrook
			—	1,2,3	—	—	—	—	—	Min. L.	

21. Mine Examination and Valuation.—The methods of examining, valuing, and reporting on a mine. Estimation and prospecting of mineral deposits. *I*; (2).

Prerequisite: Min. 3 or 4; Geology 13a and 13b, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	21	2	—	—	11	—	11	—	—	206 T. B.	Stock

41. Principles of Coal Plant Design.—Design of mine structures of wood, steel, and masonry, with drafting practise in design of coal tipples and general surface plant. *I*; (3).

Prerequisite: Civil Engineering 58.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	41	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

42. Coal Plant Design.—General layout; design; estimates for construction and specifications for coal mining plant. *II*; (2).

Prerequisite: Mining 41.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	42	2	—	9,10	—	9,10	—	—	—	207 T. B.	Holbrook

43. Principles of Ore Plant Design.—Design of mine structures of wood, steel, and masonry, with drafting practise in design of rock houses, ore bins, and crushing plants. *I*; (3).

Prerequisite: Civil Engineering 58.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	43	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

44. Ore Plant Design.—General layout; design; estimates for construction and specifications for ore mining plants. *II*; (2).

Prerequisite: Mining 43.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	44	2	—	9,10	—	9,10	—	—	—	207 T. B.	Holbrook

45. Principles of Mill and Smelter Design.—Flow sheets and structures of wood, steel, and masonry, with drafting practise on individual designs. *I*; (3).

Prerequisite: Civil Engineering 58.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	45	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

46. Mill and Smelter Design.—Revised flow sheet; design; estimates for construction and specifications for concentrating plants or smelter. *II*; (2).

Prerequisite: Mining 45.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	46	2	—	9,10	—	9,10	—	—	—	207 T. B.	Holbrook

62. Mine Surveying.—The application of general surveying methods to mine work; the description and use of instruments employed underground and in connecting surface and underground surveys; the platting and use of mine maps; mineral land surveying; the theory and use of solar attachments; determination of the meridian. A surveying trip is made to neighboring mines, of which the estimated cost is \$10.00. *II*; (3).

Prerequisite: Civil Engineering 27.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	62	3	—	—	—	—	9,10,11	—	8,9 10,11	206 T. B. 207 T. B.	Callen Callen

Mining Engineering

64. Coal Mining Laboratory.—Different coals; their availability for crushing, dry preparation, washing, and briquetting. Complete commercial tests, using small commercial machines wherever possible; design of flow sheets; analysis of products. Estimation of probable costs. *II*; (3).

Prerequisite: Mining 9 or 19.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	64	3	—	—	8-12	—	—	—	—	Min. L.	Holbrook
			—	—	1-4	—	—	—	—	Min. L.	

66. Ore Concentration Laboratory.—Complete commercial wet and dry concentration tests on raw ores of lead, zinc, iron, etc. Amalgamation and cyanidation of a gold ore. Sampling, preparation, and analysis or assay of the products recovered. *II*; (3).

Prerequisite: Mining 9 or 19.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	66	3	—	—	8-12	—	—	—	—	Min. L.	Holbrook
			—	—	1-4	—	—	—	—	Min. L.	Holbrook

68. Mine Topography.—Stadia; application of topographic and railroad surveying to mining conditions. *I*; (1).

Prerequisite: Civil Engineering 27.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	68	1	—	—	—	—	—	1,2,3	—	207 T. B.	Callen

90. Journal Meeting.—Review of mining and metallurgical literature; reports; technical writing. *II*; (1).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	90	1	—	11	—	—	—	—	—	206 T. B.	—

99. Thesis.—Individual investigation of a special mining subject; preparation of thesis giving review of the literature on the subject, the results of experimental work, and a general discussion of the subject. *II*; (3).

(Hours arranged when thesis is permitted, in accordance with regulations of the College of Engineering.)

Courses for Graduates

Entrance upon graduate work in mining engineering presupposes a full undergraduate course in that subject.

101. Advanced Mining Methods.—Coal and ore fields of the United States; methods and economics of mining; utilization, marketing, storage, and transportation of coal and ores. *Twice a week; I, II; (1 unit). Time to be arranged.*

Assistant Professor HOLBROOK

102. Advanced Preparation of Coal and Ores.—Detailed investigation and discussion of settling ratios, laws of crushing, sorting vs. sizing, etc.; specific mill and washing problems. *Twice a week; I, II; (1 unit). Time to be arranged.*

Assistant Professor HOLBROOK

Municipal and Sanitary Engineering

103. The History of Miners' Organizations.—The effect of such organizations upon the development of mining practise. *Twice a week; I, II; (1 unit). Time to be arranged.*

104. Mining Reports.—The law of the apex, the classification of coal and ore lands; conservation of mineral resources; mine examination and report. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK, Assistant Professor HOLBROOK

105. Welfare Work and Education Among Mine Employees.—The organization and operation of mining institutes, night classes, welfare, mine rescue and first-aid work, with practical experience in connection with the Illinois Miners' and Mechanics' Institutes. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK

MODERN LANGUAGES

(See ENGLISH LANGUAGE AND LITERATURE, GERMANIC LANGUAGES AND LITERATURE, and ROMANCE LANGUAGES AND LITERATURE.)

MUNICIPAL AND SANITARY ENGINEERING

ARTHUR NEWELL TALBOT, C.E., D.Sc., *Professor*

MELVIN LORENIUS ENGER, B.S., C.E., *Assistant Professor, Theoretical and Applied Mechanics*

HAROLD EATON BABBITT, B.S., *Instructor*

2. Water Supply Engineering.—Source of supply; hydraulics of wells; stream flow; impounding and storage reservoirs; conduits and pipe lines; pumps and pumping machinery; stand-pipes and elevated tanks; the distribution system; tests and standards of purity of potable water. Designing weekly. *I; (4).*

Prerequisite: Theoretical and Applied Mechanics 29, 10; Chemistry 1; Mechanical Engineering 1 or 2.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
M. & S. E.	2	4	E	8	—	8	—	8	—	208 E. H.	Enger Babbitt
				—	—	1-4	—	—	—	208 E. H.	
			F	11	—	11	1-4	11	—	208 E. H.	
			G	9	—	9	—	9	—	208 E. H.	
				—	—	—	—	1-4	—	208 E. H.	

3. Sewerage.—Design and construction of sewerage systems; sanitary necessity of sewerage; separate and combined water carriage systems, surveys, and general plans; hydraulics of sewers; house sewage and its removal; relation of rainfall to storm water flow; determination of size and capacity of sewers; forms and strength of sewer appurtenances; modern methods of sewage disposal; estimates and specifications. Designing weekly. *II; (3).*

Prerequisite: Theoretical and Applied Mechanics 29, 10; Chemistry 1; Municipal and Sanitary Engineering 2.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
M. & S. E.	3	3	E	1-4	9	—	9	—	—	208 E. H.	Babbitt
			F	—	8	8-11	8	—	—	208 E. H.	
			G	—	10	—	10	—	8-11	208 E. H.	

Municipal and Sanitary Engineering

6a-6b. Water Purification, Sewage Disposal, and General Sanitation.—

Impurities in water supplies and methods and processes of their removal; sewage disposal by filtration, chemical precipitation, irrigation; representative purification plants; garbage collection and disposal; sanitary restrictions and regulations and general sanitation. Lectures; seminar work; drafting. *I*; (3); *II*; (2).

Prerequisite: Municipal and Sanitary Engineering 2, 3; Chemistry 1, 3, 10b.

Subject	No.	Credits	Section	FIRST SEMESTER							Instructor	
				M	T	W	T	F	S	Room		
M. & S. E.	6a	3	—	10	—	—	—	—	8-11	208 E. H.	Talbot Babbitt	
			—	1-4	—	—	—	—	214 E. H.			
				SECOND SEMESTER								
	6b	2	—	8	—	1-4	—	—	—	208 E. H. 214 E. H.		

7. Water Supply Engineering.—(Similar to Municipal and Sanitary Engineering 2, for students in sanitary science.) Designing weekly. *I*; (4). *Time to be arranged.*

Mr. BABBITT

Prerequisite: Theoretical and Applied Mechanics 10; Chemistry 3.

8. Sewerage.—(Similar to Municipal and Sanitary Engineering 3, for students in sanitary science.) Designing weekly. *II*; (3). *Time to be arranged.*

Mr. BABBITT

9. Hydraulic Design and Construction.—Reservoirs, dams, conduits, and waterways; hydraulic engineering problems. *II*; (2).

Prerequisite: Municipal and Sanitary Engineering 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	9	2	—	—	2-4	—	2-4	—	—	208 E. H.	Enger

98. Thesis.— Investigation or design of an engineering problem. *II*; (2). *Time to be arranged.*

Professor TALBOT, Mr. BABBITT

Courses for Graduates

Entrance upon graduate work in municipal and sanitary engineering presupposes a full undergraduate course in that subject.

102. Water Supply Engineering.—Water supply; general water-works construction; pumps and pumping; design of reservoirs and elevated tanks; water-works operation and the valuation of plants. *One to three times a week; I or II; (1 unit). Time to be arranged.*

Professor TALBOT

103. Sewerage.—Design and construction; systems; hydraulics of sewers; a study of run-off. *Once or twice a week; II; (1 unit). Time to be arranged.*

Professor TALBOT

106. Water Purification, Sewage Disposal, and General Sanitation.—The design, construction, and operation of water purification plants and of sewage disposal works; the study of existing plants; comparison of results and cost of construction and operation; experimental work on water filters and septic tanks; garbage disposal; general sanitation. *Once a week; II; (½ unit). Time to be arranged.*

Professor TALBOT

MUSIC

JOHN LAWRENCE ERB, F.A.G.O., *Director, University Organist*

GEORGE FOSS SCHWARTZ, A.M., Mus.B., *Assistant Professor, Theory and History of Music*

CONSTANCE BARLOW-SMITH, *Assistant Professor, Sight Singing, Ear Training, Public School Music*

HENRI JACOBUS VAN DEN BERG, *Instructor, Piano*

ALBERT AUSTIN HARDING, *Instructor, Wind Instruments, Director of the Band*

EDNA ALMEDA TREAT, Mus.B., *Instructor, Piano*

EDSON WILFRED MORPHY, *Instructor, Violin*

HEBER DIGNAM NASMYTH, *Instructor, Voice*

History and Theory

1-2. History of Music.—I, II; (2).

Prerequisite: 1 year of college work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	1	2	—	—	11	—	11	—	—	102 U. H.	Schwartz

SECOND SEMESTER

Music 2 2 — Schedule the same as for 1 (first semester).

3-4. Theory of Music (Harmony).—I, II; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	3	2	A	—	—	11	—	11	—	102 U. H.	Schwartz
			B	—	—	2	—	2	—	102 U. H.	
			C	—	—	3	—	3	—	102 U. H.	

SECOND SEMESTER

Music 4 2 — Schedule the same as for 3 (first semester).

5-6. Theory of Music (Harmony).—Continuation of 3-4. I, II; (3).

Prerequisite: Music 3-4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	5	3	A	2	—	2	—	2	—	102 U. H.	Schwartz
			B	3	—	3	—	3	—	102 U. H.	Schwartz

SECOND SEMESTER

Music 6 3 — Sections and Schedule the same as for 5 (first semester).

7-8. Counterpoint, Canon, and Fugue.—I, II; (3).

Prerequisite: Music 5-6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	7	3	—	11	—	11	—	11	—	102 U. H.	Schwartz

SECOND SEMESTER

Music 8 3 — Schedule the same as for 7 (first semester).

Music

9-10. General Analysis.—*I, II; (2).*

Prerequisite: Music 7-8.

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Music	9	2	—	—	3	—	3	—	—	126 U. H.
<i>Instructor</i> Erb										

SECOND SEMESTER										
Music	10	2	—	Schedule the same as for 9 (first semester).						

11-12. Acoustics.—*I, II; (1).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Music	11	1	—	—	—	—	2	—	—	201 U. H.
<i>Instructor</i> Erb										

SECOND SEMESTER										
Music	12	1	—	Schedule the same as for 11 (first semester).						

13-14. Constructive Listening (Musical Appreciation).—*I, II; (1).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Music	13	1	—	—	—	3	—	—	—	126 U. H.
<i>Instructor</i> Erb										

SECOND SEMESTER										
Music	14	1	—	—	—	3	—	—	—	126 U. H.
<i>Instructor</i> Erb										

Public School Music

21a-21b. Ear Training, First Year.—Two hours a week; required of all music students. *I, II; (no credit).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Music	21a	—	—	9	—	9	—	—	—	126 U. H.
<i>Instructor</i> Schwartz										

SECOND SEMESTER										
Music	21b	—	—	Schedule the same as for 21a (first semester).						

22a-22b. Ear Training, Second Year.—Two hours a week; required of students in the course in Music in the sophomore year, and of students in the course in Public School Music. *I, II; (1).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Music	22a	1	—	—	9	—	9	—	—	126 U. H.
<i>Instructor</i> Smith										

SECOND SEMESTER										
Music	22b	1	—	Schedule the same as for 22a (first semester).						

23a-23b. Sight Singing, First Year.—Two hours a week; required of students in the course in Music in the sophomore year, and of students in the course in Public School Music. *I, II; (no credit).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Music	23a	—	—	10	—	10	—	—	—	126 U. H.
<i>Instructor</i> Smith										

SECOND SEMESTER										
Music	23b	—	—	Schedule the same as for 23a (first semester).						

24a-24b. Sight Singing, Second Year.—Two hours a week; required of students in the course in Music in the junior year, and of students in the course in Public School Music. *I, II; (1).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	24a	1	—							(Arrange)

SECOND SEMESTER										
Music	24b	1	—	Schedule the same as for 24a (first semester).						

25a-25b. Methods of Teaching.—Elements of theory, eye and ear training, the limitations of the child-voice, selection of material, pedagogical presentations, appreciation work for the high school. (Primarily for students preparing to teach music in the public schools.) *I, II; (4).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	25a	4	—	2	2	2	2	—	—	126 U. H.

SECOND SEMESTER										
Music	25b	4	—	Schedule the same as for 25a (first semester).						

27a-27b. Ensemble.—*I, II; (1). Time to be arranged.*

Piano

Mr. VAN DEN BERG, Miss TREAT

Hours to be arranged.

(In registering for the first semester use the first of the two hyphenated numbers attached to each course, and in registering for the second semester use the second number; for example, register for Music 41a for the first semester, and for Music 41b for the second semester.)

41a-41b. Preparatory Course in Piano, First Year.—*I, II.* (No collegiate credit).

41c-41d. Preparatory Course in Piano, Second Year.—*I, II.* (No collegiate credit).

41e-41f. Preparatory Course in Piano, Third Year.—*I, II.* (No collegiate credit).

42a-42b. Piano, First Year.—*I, II; (6).*

43a-43b. Piano, Second Year.—*I, II; (6).*

44a-44b. Piano, Third Year.—*I, II; (6).*

45a-45b. Piano, Fourth Year.—*I, II; (6).*

46a-46b, 46c-46d. Piano, Two Years.—The first two years' work in piano taken as a minor by senior collegiate students majoring in voice or violin. *I, II; (2).*

47a-47b. Piano.—For students from other departments of the university. *I, II; (no credit).*

Voice

Mr. NASMYTH

Hours to be arranged.

(See note above, under courses in piano.)

Music

51a-51b. Preparatory Course in Voice, First Year.—*I, II*; (no collegiate credit).

51c-51d. Preparatory Course in Voice, Second Year.—*I, II*; (no collegiate credit).

51e-51f. Preparatory Course in Voice, Third Year.—*I, II*; (no collegiate credit).

52a-52b. Voice, First Year.—*I, II*; (6).

53a-53b. Voice, Second Year.—*I, II*; (6).

54a-54b. Voice, Third Year.—*I, II*; (6).

55a-55b. Voice, Fourth Year.—*I, II*; (6).

56a-56b, 56c-56d. Voice, Two Years.—The first two years' work in voice taken as a minor by senior collegiate students majoring in piano or violin. *I, II*; (2).

57a-57b. Voice.—For students from other departments of the University. *I, II*; (no credit).

Violin

MR. MORPHY

Hours to be arranged.

(See note under courses in piano.)

61a-61b. Preparatory Course in Violin, First Year.—*I, II*; (no collegiate credit).

61c-61d. Preparatory Course in Violin, Second Year.—*I, II*; (no collegiate credit).

61e-61f. Preparatory Course in Violin, Third Year.—*I, II*; (no collegiate credit).

62a-62b. Violin, First Year.—*I, II*; (6).

63a-63b. Violin, Second Year.—*I, II*; (6).

64a-64b. Violin, Third Year.—*I, II*; (6).

65a-65b. Violin, Fourth Year.—*I, II*; (6).

66a-66b, 66c-66d. Violin, Two Years.—The first two years' work in violin taken as a minor by senior collegiate students majoring in piano or voice. *I, II*; (2).

67a-67b. Violin.—For students from other departments of the University. *I, II*; (no credit).

Violoncello

MR. SCHWARTZ

Hours to be arranged.

(See note above, under courses in piano.)

71a-71b. Preparatory Course in Violoncello, First Year.—*I, II*; (no collegiate credit).

71c-71d. Preparatory Course in Violoncello, Second Year.—*I, II*; (no collegiate credit).

71e-71f. Preparatory Course in Violoncello, Third Year.—*I, II*; (no-collegiate credit).

72a-72b. Violoncello, First Year.—*I, II*; (6).

73a-73b. Violoncello, Second Year.—*I, II*; (6).

74a-74b. Violoncello, Third Year.—*I, II*; (6).

Organ

Director ERB

Hours to be arranged.

Students desiring to take organ will be obliged to pass without conditions the entrance examination in piano. Under no circumstances will they be accepted if their piano work falls below the standard represented by this examination.

81-82. Organ, First Year.—*I, II*; (6).

83a-83b, 83c-83d. Organ, Two Years.—First two years' work in organ taken as a minor by senior collegiate students majoring in piano, voice, or violin. *I, II*; (2).

84-85. Organ, Second Year.—*I, II*; (6).

86-87. Organ, Third Year.—*I, II*; (6).

88-89. Organ, Fourth Year.—*I, II*; (6).

*Band, Orchestra, and Ensemble Work

91a-91b. Orchestra.—*I, II*; (no credit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	91a	—	—	—	—	4	—	—	—	Chapel	Morphy

SECOND SEMESTER

Music 91b — — Schedule the same as for 91a (first semester).

92a-92b. Band Instruments.—*I, II*; (no credit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	92a	—	—	—	—	—	—	—	—	(Arrange)	Harding

SECOND SEMESTER

Music 92b — — Schedule the same as for 92a (first semester).

93a-93b. Choral Society.—*I, II*; (no credit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	93a	—	—	—	—	—	7 P.M.	—	—	Chem. Lec. Room	Erb

SECOND SEMESTER

Music 93b — — Schedule the same as for 93a (first semester).

*For information concerning registration in the University bands, see the Director of the Band, 217 U. H., or Director of the School of Music, 201 U. H.

Philosophy

94a-94b. **Recital Course in Practical Music.**—(For seniors in Music 45a-45b, 55a-55b, 65a-65b, 88-89). *Time to be arranged.*

96a-96b. **Band Instrumentation.**—*I, II*; (no credit). *Time to be arranged.*

97a-97b. **Band Arranging.**—*I, II*; (no credit). *Time to be arranged.*

PALEONTOLOGY

(See GEOLOGY 1a, 16, 18, 19, 20, 21.)

PHILOLOGY

(See CLASSICS, ENGLISH LANGUAGE AND LITERATURE, GERMANIC LANGUAGES AND LITERATURE, and ROMANCE LANGUAGES AND LITERATURE.)

PHILOSOPHY

(See also PSYCHOLOGY and EDUCATION.)

ARTHUR HILL DANIELS, Ph.D., *Professor*

BOYD HENRY BODE, Ph.D., *Professor*

QUEEN LOIS SHEPHERD, Ph.D., *Instructor*

CARL HERMAN HAESSLER, A.B., *Assistant*

Major: Twenty hours from any courses offered by the department, including Philosophy 1, 2, 3, and 4, and one other advanced course. Six hours in psychology may be counted toward a major in philosophy.

Minors: Twenty hours in (a) psychology (at least six additional hours, if psychology is counted toward a major), and one other subject in the following list; or (b) any two subjects in the same group in the following list: (A) economics, history, political science, education, sociology; (B) English, French, German, Greek, Latin; (C) botany, chemistry, mathematics, physics, zoology. No course in any subject of the above groups may be counted for the minor requirement if it is excluded from the major requirement of its respective department.

Courses for Undergraduates

1. **Logic.**—The principles of reasoning; detection of fallacies; evidence. *I or II*; (3).

Prerequisite: One year of university work.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Philosophy	1	3	—	1	—	1	—	1	—	100 Com.	Bode Shepherd Haessler
SECOND SEMESTER											
			—	2	—	2	—	2	—	100 Com.	Bode Shepherd Haessler

2. **Introduction to Philosophy.**—Philosophic problems in their relation to the doctrine of evolution and in their bearing on conduct and religion. *II*; (3).

Prerequisite: Two years of university work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	2	3	—	1	—	1	—	1	—	100 Com.	Bode Shepherd

9. **Political and Social Ethics.**—Moral principles applied to political and social relations. *I*; (2).

Prerequisite: Two years of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	9	2	—	—	10	—	10	—	—	308 L. H.	Daniels

Courses for Advanced Undergraduates and Graduates.

3. **History of Ancient and Medieval Philosophy.**—*I*; (3).

Prerequisite: Three hours in philosophy.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	3	3	—	11	—	11	—	11	—	113 L. H.	Daniels

4. **History of Modern Philosophy.**—From the Renaissance to the present time. *II*; (3).

Prerequisite: Three hours in philosophy.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	4	3	—	3	—	3	—	3	—	117 L. H.	Shepherd

7. **Ethics.**—The beginnings and growth of morality; the fundamental questions of ethical theory; social and economic problems of the present. *II*; (3).

Prerequisite: Three hours in philosophy.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	7	3	—	11	—	11	—	11	—	117 L. H.	Daniels

11. **Philosophy of Religion.**—The philosophical interpretation of religious consciousness. Topics: God, revelation, inspiration, dogma, prayer, faith, immorality, the problem of evil; the relation of morality and religion. *II*; (2).

Prerequisite: Senior or graduate standing; six hours in psychology, philosophy, or both.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	11	2	—	—	11	—	11	—	—	117 L. H.	Daniels

15. **British Philosophers of the Eighteenth Century.**—Locke, Berkeley, and Hume. *I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	15	3	—	(Arrange)						113 L. H.	Bode

Philosophy

16. Philosophy of Pragmatism.—II; (3).

Prerequisite: Philosophy 15.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	16	3	—					(Arrange)		113 L. H.	Bode

18. **Philosophers of the Nineteenth Century.**—Philosophical tendencies in materialism, naturalism, idealism, and pragmatism. *I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	18	3	—					(Arrange)		113 L. H.	Shepherd

19. **Religious Thought in the Eighteenth and Nineteenth Centuries.**—*I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	19	3	—	3	—	3	—	3	—	113 L. H.	Shepherd

Courses for Graduates

Students entering upon graduate work in philosophy must have had a thoro course in the history of philosophy, a course in logic, and a general course in psychology.

103. **Seminar in Ethics.**—British ethics from Hobbes to Sidgwick. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	103	1 unit	—					(Arrange)		107 L. H.	Daniels

107a-107b-107c. **History of Philosophy.**—a: Plato and Aristotle. *Twice a week; (1 unit).* b: Descartes, Spinoza, and Leibnitz. *Twice a week; (1 unit).* c: Kant and Schopenhauer. *Twice a week; (1 unit).* *I, II.* The subjects for 1915-16 are 107b, and 107c.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	107b 107c	1 unit	—					(Arrange)		107 L. H.	Daniels

108a-108b-108c. **Seminar in Contemporary Philosophy.**—a: idealism. *Twice a week; (1 unit).* b: Realism and pragmatism. *Twice a week; (1 unit).* c: The philosophy of Bergson. *Twice a week; (1 unit).* *I, II.* The subject for 1915-16 is 108a.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	108a	1 unit	—					(Arrange)		107 L. H.	Bode

PHOTOGRAPHY

ARTHUR GRENVILLE ELDREDGE, *Instructor*

1. The Principles and Practise of Photography.—For advanced students who use photography in connection with their special subjects. Lenses; cameras; plates and films; exposure; development; printing; copying; positives; landscape, architectural, and scientific photography; speed work; color photography. Lectures and demonstrations; each student is required to produce a stated amount of work covering the processes treated. *II; (one hour a week, no credit).*

Prerequisite: Junior standing and the consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Photography	1	—	—	—	2-5	—	—	—	—	404 P. L.	Eldredge

(Other hours to be arranged.)

PHYSICAL TRAINING FOR MEN

GEORGE A HUFF, *Director*HARRY LOVERING GILL, *Associate, Track*RALPH JONES, *Associate, Basket Ball*ROBERT CARL ZUPPKE, *Associate, Foot Ball*ROY NEWTON FARGO, B.S., *Director of the Men's Gymnasium*EDWARD JOHN MANLEY, *Instructor, Swimming*OLAF HAROLD GLIMSTEDT, *Assistant*

1-2. Gymnasium Practise.—Two hours' gymnasium drill each week. (Required of freshmen. First semester given in conjunction with 1a below.) *I; (½): II; (1).*

NOTE: Freshmen should register for both 1 and 1a the first semester.

1a. Personal Hygiene.—Six lectures by the Dean of Men. Required in conjunction with Physical Training 1. These lectures begin Monday, September 27, 1915. *I; (First six weeks).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	1	½	A	10	—	10	—	—	—	Gym.	Fargo
			B	—	—	11	—	11	—		
			C	2	—	2	—	—	—		
			D	—	—	3	—	3	—		
			E	—	10	—	10	—	—		
			F	—	11	—	11	—	—		
			G	—	2	—	2	—	—		
			H	—	3	—	3	—	—		
P. T.	1a	½	A	—	—	—	—	11	—	100 Com.	Clark
			B	—	—	—	11	—	—	204 Com.	
			C	4	—	—	—	—	—	100 Com.	
			D	—	3	—	—	—	—	100 Com.	
			E	—	—	4	—	—	—	100 Com.	
			F	—	—	—	4	—	—	100 Com.	
			G	—	—	—	—	4	—	100 Com.	

SECOND SEMESTER

P. T. 2 1 — Sections and schedule the same as for 1 (first semester).

Physical Training

PHYSICAL TRAINING FOR WOMEN

LOUISE FREER, A.B., B.S., *Director*

VERNA BROOKS, A.B., *Instructor*

ANNA LUE HUGHITT, *Instructor*

EDITH GRIFFITH OSMOND, A.B., B.S., *Instructor*

ROSA-LEE GAUT, Mus.B., *Assistant*

7a-7b. Practise.—Class work; individual experimentation in personal hygiene; individual corrective work; games. Required of freshmen. *I, II; (1).*

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
P. T.	7a	1	A	9	—	9	—	9	—	W. B.	Hughitt Brooks Osmond
			B	—	10	—	10	10	—	W. B.	
			C	11	—	11	—	11	—	W. B.	
			D	11	—	11	—	11	—	W. B.	
			E	2	—	2	—	2	—	W. B.	
			F	2	—	2	—	2	—	W. B.	
			G	3	—	3	3	—	—	W. B.	
			H	—	3	—	3	3	—	W. B.	

SECOND SEMESTER											
P. T.	7b	1	—	Sections and schedule the same as for 7a (first semester).							

8a-8b. Practise.—(Continuation of 7a-7b. Second year, elective). *I, II; (1).*

Prerequisite: P. T. 7a-7b.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
P. T.	8a	1	A	10	—	10	—	10	—	W. B.	Brooks Hughitt Osmond
			B	3	—	3	—	3	—	W. B.	
			C	4	4	4	—	—	—	W. B.	

SECOND SEMESTER											
P. T.	8b	1	—	Sections and schedule the same as for 8a (first semester).							

9. Hygiene.—Required of freshmen. *I; (1).*

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
P. T.	9	1	—	4	—	—	—	—	—	—	Kyle

10a-10b. Teachers' Course.—Third year. Kinesiology, history of education and theory of practise and practise of teaching. Theory, one hour; practise in the gymnasium and in the public playgrounds. *I, II; (1).*

Prerequisite: P. T. 7a-7b; P. T. 9; Psychology 1.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
P. T.	10a	1	—	—	—	—	—	—	10-12	W. B.	Osmond

SECOND SEMESTER											
P. T.	10b	1	—	Schedule the same as for 10a (first semester).							

11a-11b. Teachers' Course.—Fourth year. A. Anthropometry, massage, corrective gymnastics. B. First aid. *I, II.* (no credit).

Prerequisite: P. T. 10a-10b.

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
P. T.	11a	—	—	(Arrange)					
								Room	Instructor
								W. B.	Hughitt
SECOND SEMESTER									
P. T.	11b	—	—	(Arrange)					
								Room	Instructor
								W. B.	Hughitt

PHYSICS

ALBERT PRUDEN CARMAN, D.Sc., *Professor*
 CHARLES TOBIAS KNIPP, Ph.D., *Associate Professor*
 FLOYD ROWE WATSON, Ph.D., *Associate Professor*
 JAKOB KUNZ, Ph.D., *Associate Professor, Mathematical Physics*
 WILLIAM FREDERICK SCHULZ, Ph.D., *Assistant Professor*
 ELMER HOWARD WILLIAMS, Ph.D., *Associate*
 WILLIAM HENRY HYSLOP, A.M., *Assistant*
 OSCAR ALAN RANDOLPH, M.S., *Assistant*
 EARLE HORACE WARNER, A.M., *Assistant*
 SEBASTIAN KARRER, A.M., *Assistant*
 JONAS BERNARD NATHANSON, A.M., *Assistant*
 PAUL LEVERN BAYLEY, A.M., *Assistant*
 CHARLES FRANCIS HILL, A.B., *Assistant*
 CHARLES STEVER FAZEL, A.M., *Assistant*

Courses 7a-7b, and 8a-8b are recommended to students not specializing in mathematics, chemistry, or engineering. For undergraduate students taking advanced work or a major in physics, the following outline of work is suggested:

Freshman year: Trigonometry (Math. 4) and Chemistry.

Sophomore year: Physics 1a-1b, 3a-3b, or Physics 7a-7b, 8a-8b.

Junior year: Physics 15, 16, 17, 23, or 24.

Senior year: Physics 4a-4b, 14a-14b, 20, 22, 25, 30, or 31.

Introductory Courses for Undergraduates

1a-1b. General Physics.—Lectures with class-room demonstration; recitations; written exercises. (For sophomores in engineering, mathematics, physics, and chemistry.) *I*; (3): *II*; (2).

Prerequisite: Registration in Physics 3a-3b; freshman mathematics.

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
Physics	1a	3	Lecture I	9	—	9	—	—	—
			Lecture II	11	—	11	—	—	—
			Quiz						
			C	—	—	—	—	11	—
			D	—	—	—	—	11	—
			E	—	—	—	—	11	—
			F	—	—	—	—	11	—
			G	—	—	—	—	9	—
			K	—	—	—	—	9	—
			L	—	—	—	—	9	—
			M	—	—	—	—	11	—
			N	—	—	—	—	9	—
			O	—	—	—	—	9	—
			P	—	—	—	—	9	—
			Q	—	—	—	—	11	—
								Room	Instructor
								100 P. L.	Carman
								100 P. L.	Carman
								104 P. L.	Carman
								108 P. L.	Schulz
								302 P. L.	Hyslop
								305 P. L.	Warner
								306 P. L.	Nathanson
								403 P. L.	Hill
								406 P. L.	Bayley
SECOND SEMESTER									
Physics	1b	2	—	Sections and schedule the same as for 1a (first semester).					

Physics

3a-3b. Physical Measurements.—Laboratory experiments; quizzes in connection with Physics 1a-1b. *I, II; (2).*

Prerequisite: Registration in Physics 1a-1b or credit for the same.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	3a	2	C	—	8-10	—	8-10	—	—	305 P. L. 312 P. L. 403 P. L. 406 P. L.	Schulz Hyslop Warner Nathanson Hill Bayley
			D	—	8-10	—	8-10	—	—		
			E	—	2-4	—	2-4	—	—		
			F	—	—	2-4	—	—	10-12		
			G	—	10-12	—	10-12	—	—		
			K	10-12	—	10-12	—	—	—		
			L	10-12	—	10-12	—	—	—		
			M	2-4	—	—	—	2-4	—		
			N	2-4	—	—	—	2-4	—		
			O	—	10-12	—	10-12	—	—		
			P	—	2-4	—	2-4	—	—		
			Q	8-10	—	8-10	—	—	—		
SECOND SEMESTER											
Physics	3b	2	—	Sections and schedule the same as for 3a (first semester).							

7a-7b. General Physics.—Lectures, with class-room demonstrations; recitations. (For students in arts and science.) *I, II; (2½).*

Prerequisite: Completion of or registration in trigonometry (Mathematics 4); registration in Physics 9a-9b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	7a	2½	Lecture	—	11	—	11	—	—	119 P. L.	Watson Williams Karrèr
			A, Quiz	—	—	—	—	9	—	208 P. L.	
			B, Quiz	—	—	—	—	10	—	208 P. L.	
			*C, Quiz	—	—	—	—	8	—	302 P. L.	
SECOND SEMESTER											
Physics	7b	2½	— Sections and schedule the same as for 7a (first semester).								

8a-8b. Introductory Laboratory Physics.—Physical measurements. *I, II; (2½).*

Prerequisite: Registration in Physics 7a-7b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	8a	2½	A	10-12	—	10-12	—	—	—	212 P. L.	Williams Karrer
			B	2-4	—	2-4	—	—	—	212 P. L.	
			*C	—	1-3	—	1-3	—	—	212 P. L.	
SECOND SEMESTER											
Physics	8b	2½	—	Sections and schedule the same as for 8a (first semester).							

9a-9b. General Physics.—Lectures, with class-room demonstrations; recitations. (For students in architecture.) *I, II; (2).*

Prerequisite: Trigonometry (Mathematics 4); registration in Physics 10a-10b.

*Section C is reserved for agricultural students.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	9a	2	Lecture	—	11	—	11	—	—	119 P. L.	Watson
			A, Quiz	—	—	—	—	9	—	119 P. L.	Williams
			B, Quiz	—	—	—	—	11	—	208 P. L.	Karrer

SECOND SEMESTER											
Physics	9b	2	—	Sections and schedule the same as for 9a (first semester).							

10a-10b. Introductory Laboratory Physics.—Physical measurements. I, II; (2).

Prerequisite: Registration in Physics 9a-9b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	10a	2	A	8-10	—	8-10	—	—	—	212 P. L.	Williams
			B	—	8-10	—	8-10	—	—	119,305 P.L.	Karrer

SECOND SEMESTER											
Physics	10b	2	—	Sections and schedule the same as for 10a (first semester).							

Intermediate Courses

15. Electricity and Magnetism.—Recommended to students in non-technical courses who wish a knowledge of electricity and magnetism beyond the course in general physics. Two recitations or lectures and one three-hour laboratory exercise weekly. Brooks and Poyser's *Electricity and Magnetism*. I; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	15	3	—	9	—	9	—	1-4	—	208 P. L.	Knipp
			—	—	—	—	—	—	—	112 P. L.	Knipp

16. Heat.—Fundamental heat phenomena, the mechanical theory of heat and elementary thermodynamics. Laboratory experiments in thermometry, calorimetry, vapor pressure, expansion of bodies, transmission of heat, and mechanical equivalent. I; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	16	3	—	—	9	—	9	—	9-12	208 P. L.	Watson
			—	—	—	—	—	—	—	213 P. L.	Watson

17. Light.—Reflection, refraction, interference, diffraction, and polarization; the theory and use of optical instruments; lectures and laboratory. For students in general physics, but also adapted to those who wish to learn the use of the refractometer, telescope, microscope, polarising microscope, polarimeter, saccharimeter, spectrometer and interferometer. Clay's *Treatise on Practical Light*. II; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	17	3	—	—	2-4	—	2-5	—	—	301 P. L.	Schulz
			—	—	—	—	—	—	—	303 P. L.	Schulz

Physics

[18. **Teachers' Course.**—Discussion of text-books, reference books, laboratory manuals, apparatus ordering, and methods of conducting work in physics. Manipulative work with glass and apparatus. Discussion of selected topics in advanced general physics. *II*; (3). (Not given in 1915-16).

Prerequisite: A course in general physics, or experience in teaching.]

23. **Sound.**—The phenomena of sound, its origin, propagation, velocity, interference, and diffraction; the vibrations of strings and organ pipes and the physical theory of music and speech. Lectures, recitations, laboratory. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	23	3	—	—	9	—	9	—	9-12	306 P. L.	Watson

24. **Properties of Matter.**—The fundamental properties of matter, weight, mass, gravitation, elasticity, viscosity, surface tension, and diffusion. Lectures and recitations. Laboratory measurements including the use of the dividing engine, chronograph, etc. Poynting and Thomson's *Properties of Matter*, and Watson's *Text-book of Practical Physics*. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	24	3	—	—	10	—	10	—	9-12	208 P. L. 213 P. L.	Williams Williams

Courses for Undergraduates and Graduates

4a-4b. **Electrical and Magnetic Measurements.**—Exact electrical and magnetic measurements with accompanying theory. The course for the first semester includes the more refined and special methods of measuring very high and very low resistances; galvanometers both aperiodic and ballistic; the measurement of electric currents and quantity; the comparison of capacities. In the second semester is given the absolute determination of capacity; the determination of the damping factor of a ballistic galvanometer; a discussion of circuits containing resistance and self-induction followed by several of the classical methods for the measurement of self and mutual induction; the magnetic properties of iron are studied by several methods, curves are plotted and hysteresis losses determined. Work with various types of potentiometers is also included. For the first semester, there is a special section for students of chemistry, including a course of experiments on the measurement of electrolytic resistance, the use of the Dolezalek electrometer, of thermo-couples, and of platinum resistance thermometers for measuring temperatures; the determination of the dielectric constants of solids and liquids; and special uses of the potentiometer. *I, II*; (2).

Prerequisite: Physics 1a-1b, 3a-3b, or 7a-7b, 8a-8b and Mathematics 7, 9.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	4a	2	K	1-4	—	—	1-4	—	—	112 P. L.	Knipp
			L	—	1-4	—	—	—	8-11	112 P. L.	
			M	—	—	1-4	—	8-11	—	112 P. L.	Fazel
			N	9-12	—	—	—	1-4	—	112 P. L.	

NOTE: Special section for chemical students. (Arrange time).

SECOND SEMESTER

Physics 4b 2 — Sections and schedule the same as for 4a (first semester).

14a. Introduction to Theoretical Physics.—Dynamics. Recitations, problems, and lectures. First course in theoretical physics, intended to put in systematic form the fundamental facts and concepts of motion, mass, and force, with problems from pure and applied physics. For the student of general science as well as for students of physics and mathematics. Jean's *Theoretical Mechanics. I*; (3).

Prerequisite: Physics 1a-1b, 3a-3b, or 7a-7b, 8a-8b; Math. 8 or 7 and 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	14a	3	—	—	8	—	8	—	8	208 P. L.	Carman

14b. Introduction to Theoretical Physics.—Elementary Thermodynamics and Wave Motion. Recitations, problems, and lectures. The phenomena of heat and of wave energy are discussed with calculus methods. *II* (3).

Prerequisite: Physics 1a-1b, 3a-3b or 7a-7b, 8a-8b; Math. 8 or 7 and 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	14b	3	—	—	8	—	8	—	8	208 P. L.	Carman

20. Light.—Special phenomena; modern theories; readings in texts of Drude, Wood, and Preston. Lectures; recitations. *I*; (2).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b; Mathematics 7, 9, or 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	20	2	—	4	—	—	—	4	—	301 P. L.	Schulz

22. Light-Photometry.—Lectures, recitations, and laboratory experiments on the scientific principles and methods of photometry; the comparison of light sources with standards; the determination of reflective power and transmission coefficients; spectrophotometry. *I*; *(2 to 5).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	22	*2 to 5	—	—	2-4	—	2-5	—	—	301,401 P.L.	Schulz

[25. Heat.—Advanced laboratory work in heat; the theory and methods of measurement of temperatures by thermocouples, resistance thermometers, and optical pyrometers. *II*; (2). (Not given in 1915-16).

Associate Professor WATSON

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b. Physics 16 advised.]

26. Architectural Acoustics.—Acoustics of auditoriums; the common acoustical defects and their cures; the transmission of sound through materials; acoustical properties of building materials. Lectures and problems. (For eight weeks only). *II*; (1).

Prerequisite: Physics 1a-1b, 3a-3b; or 9a-9b, 10a-10b.

*In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Physics

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	26	1	—	9	—	9	—	—	—	119 P. L.	Watson

30. Introduction to Theoretical Electricity.—Electrical and magnetic phenomena discussed with calculus methods. Magnetism, electrostatics, electrolysis, thermo-electricity, electromagnetics, varying currents, alternating currents, units, electromagnetic radiation, conduction through gases, radio-activity, and electrons. For advanced students in physics, chemistry, mathematics, and engineering. Lectures, recitations, and demonstrations. Starling's *Electricity and Magnetism. II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	30	3	—	—	9	—	9	—	9	104 P. L.	Knipp

31a-31b. Special Problems in Advanced Physical Measurements.—*I, II*; *(2 or 3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	31a	*2 or 3	—					(Arrange)			

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	31b	*2 or 3	—					(Arrange)			

Carman
Knipp
Watson
Schulz
Williams

32. Electricity and Magnetism.—Electrical measurements; special methods of measuring self and mutual inductance, capacity, etc.; measurement of low resistances; standardization and calibration work. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	32	2	—	—	1-4	—	1-4	—	—	103 P. L.	Williams

Courses for Graduates

The prerequisite for graduate work in physics is a college course in general physics with a year's laboratory course in introductory physical measurements. The student who is to do major work in physics should also have had additional courses in physics or teaching experience, unless the training in his minor subjects, mathematics or chemistry, has been strong and complete. He should also have a knowledge of French and German sufficient to use references in these languages. The courses named below are those open for candidates for the Master's or Doctor's degree. A large part of the last year's work of the candidate for the Doctor's degree is investigational, along either the experimental or the theoretical side of physics. In addition to these major graduate courses, the courses in elementary dynamics, heat, light, electrical measurements, and introductory electrical theory, are arranged with certain additions for graduate credit. The "intermediate" courses on heat, light, and electricity and magnetism may be offered by students making a minor in physics.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

[121. **Recent Advances in Physics and the Electron Theory.**—A series of lectures of a non-mathematical character describing and discussing some of the more recent discoveries in physics, and showing by experiments some of the leading phenomena. *Three hours a week. II; ($\frac{1}{2}$ unit).* Not given in 1915-16.

Associate Professors KNIPP and KUNZ]

123. **Sound.**—Wave motion; forced vibrations; the velocity and energy relations of sound waves; resonance; vibrations of strains and organ pipes; and the dissipation of sound into heat. Lectures and recitations. Rayleigh's *Theory of Sound*, Auerbach's *Akustik*, and Barton's *Sound*. *Three times a week. II; ($\frac{3}{4}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	123	$\frac{3}{4}$ unit	—	11	—	11	—	11	—	208 P. L.	Watson

(or arrange)

124. **Conduction of Electricity Through Gases.**—Quantitative experiments on discharge phenomena, including the production of electrons and ions in a discharge tube and the magnetic and electrostatic deflection of the same, the determination of e/m and v of the electron for cathode rays, of e/m for canal-strahlen or positive rays, and experiments with the hot lime cathode. Roentgen rays and the related phenomena of radio-activity. In the second semester an original problem is taken up and carried to completion. *Three times a week; I, II; (1 to 2 units).* Time to be arranged.

Associate Professor KNIPP

126. **Physics Colloquium.**—Weekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems in physics. Many of these papers are on investigations in progress in the laboratory and experimental demonstrations are used. Attendance is expected of all graduate students, tho it is not registered except in the cases of those making special reports on original investigations. *Once a week; I, II; ($\frac{1}{4}$ to $\frac{1}{2}$ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	126	$\frac{1}{4}$ to $\frac{1}{2}$ unit	—	—	—	—	6:45—	—	—	—	—

8:00 P.M.

127a. **The Electron Theory.**—Problems of radiation; the theory of relativity and the electromagnetic emission theory of light; the laws of radiation of the black body; Planck's theory; the constant h ; the photoelectric effect, the specific heat, and Roentgen rays. The present literature of the physical journals on these topics will be used. Partly a seminar course, in which the students take an active part. *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	127a	1 unit	—				(Arrange)			306 P. L.	Kunz

131. **Investigation of Special Problems.**—Advanced laboratory or design and calculation. A problem worked out with the advice and direction of the instructor. *Two to four times a week; I, II; (1 to 2 units).*

Physics

				BOTH SEMESTERS							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	131	1 to 2 units	—							(Arrange)	Carman Knipp Watson Kunz Schulz Williams

132. Mathematical Physics.—Special phases in theoretical physics.

(a). **Dynamics.**—Newton's equations, general methods of integration, potential-theory, potential of the ellipsoid, application to celestial mechanics, the principles of least constraint, of virtual work, of D'Alembert, of Hamilton, the applications of the principle of least action in elasticity, hydrodynamics, electro-dynamics, and the second principle of thermodynamics, the theory of the gyro-scope with its applications. These subjects form the first part of the course. In the second part, special problems of hydrodynamics and of electricity will be treated. Reference books recommended: Routh, *Rigid Dynamics*; Appel, *Traite de mecanique rationnelle*. *Three times a week; I, II; (2 units).*

Subject	No.	Credits	Section	BOTH SEMESTERS							Room	Instructor
				M	T	W	T	F	S			
Physics	132a	2	—	10	—	10	—	10	—	306 P. L.	Kunz	
(or arrange)												

[(b). **Electrodynamics.**—Lectures; collateral reading. Problems from Jean's *Mathematical Theory of Electricity and Magnetism*; the potential theory: spherical harmonics, conjugate functions, and some theorems of the vector analysis; capacities, coefficients of self, and mutual induction; theory of absolute electrical measurements and the condenser discharge with its application in wireless telegraphy; Maxwell's theory with some applications in optics such as the optical properties of metals; modern modifications of Maxwell's theory; the theory of relativity and the electromagnetic emission theory of light. Continued in the following year in course 132d. Not given, 1915-16.]

[(c). **Thermodynamics and Kinetic Theory of Matter.**—The two fundamental principles developed and applied to various physical and chemical phenomena, such as elasticity, surface tension, vapor pressure, osmotic pressure, electromotive forces of galvanic cells, etc.; the theory of chemical equilibrium; the Nernst theorem with its applications; the direct method of Carnot's cycle together with the method of the thermodynamic potentials and the derived functions; the kinetic theory of gases; the elementary theorems briefly repeated; the phenomena of transfer of mass, momentum and energy; Maxwell's theory of the distribution of velocities in a gas; Boltzman's H theory and the connection between entropy and probability and statistical mechanics; the theory of radiation, especially Planck's theory of quanta, and the recent applications in specific heat and photoelectricity. Current literature. *I, II; (1 to 2 units).* Not given, 1915-16.]

[(d). **Theory of Electrical Oscillations and Cylindrical Harmonics.**—*Four times a week; I, II; (1 to 2 units).* Not given, 1915-16.]

133. Seminar.—*Three or five times a week; I, II; (1 to 3 units).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	133	1 to 3 units —								
										(Arrange)
										Carman
										Knipp
										Watson
										Kunz
										Schulz

PHYSIOLOGY

WILLIAM EDWARD BURGE, Ph.D., *Assistant Professor*

JOSEPH HOWARD BEARD, A.M., M.D., *Instructor*

ALMA JESSIE NEILL, A.B., *Assistant*

4. General Physiology, Chemical and Experimental.—Lectures, demonstrations, recitations, and laboratory work. *I* or *II*; (5).

Prerequisite: One semester of university work, including five hours in botany or zoology and five hours in chemistry.

EITHER SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	4	5 Lecture	—	9	—	—	—	9	228 N. H.	
		A, Laboratory	—	—	8,9	—	8,9	—	413 N. H.	
		B, Laboratory	—	—	1,2	—	1,2	—	413 N. H.	
		Quiz	—	—	—	8	—	—	228 N. H.	

1. Histology.—Fundamental mammalian tissues; microscopic anatomy of the organs. Lectures and laboratory. *I*; (3).

Prerequisite: Two years of university work, including five hours in botany or zoology.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	1	3 Lecture	—	—	—	—	8	—	415 N. H.	Burge
		Laboratory	—	8,9	—	8,9	—	—	415 N. H.	Beard

8. Microscopical Anatomy of the Organs.—Epithelial, connective, muscular, and nervous tissues and their relationships in the different organs of the body. Lectures and laboratory. *II*; (5).

Prerequisite: Two years of university work, including Physiology 1.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	8	5 Lecture	8	—	8	—	—	—	415 N. H.	Burge
		Laboratory	—	8,9	—	8,9	—	8,9	413 N. H.	Beard

2. Experimental Physiology.—Nerve and muscle, circulation, respiration, and secretion. Lectures and laboratory. *II*; (5).

Prerequisite: Two years of university work, including Physiology 4 and 8.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	2	5 Lecture	4	—	4	—	—	—	413 N. H.	Burge
		—	—	10,11	—	10,11	—	10,11	413 N. H.	Beard

5. Physiology of Nutrition.—Lectures and demonstrations. *II*; (2).

Prerequisite: Physiology 4.

Political Science

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	5	2	Lecture	—	4	—	4	—	—	415 N. H.	Burge

6. Neurology.—Gross and microscopic anatomy of the brain and spinal cord. *I*; (3).

Prerequisite: Physiology 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	6	3	Lecture	9	—	—	—	—	—	415 N. H.	Burge
			Laboratory	—	10,11	—	10,11	—	—	413 N. H.	Beard

7. Physiological Optics.—Lectures; demonstrations; laboratory. *II*; (3).

Prerequisite: Physics 7a-7b, 8a-8b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	7	3	Lecture					(Arrange)		415 N. H.	Burge
			Laboratory					(Arrange)		415 N. H.	Burge

Courses for Graduates

100. Research.—Minimum of five semester hours is required. *I, II.*

Prerequisite: Physiology 2 or its equivalent.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	100	—	—					(Arrange)		416 N. H.	Burge

101. Journal Club.—Required of graduate students. *I, II.*

Prerequisite: Consent of the department.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	101	—	—					(Arrange)		415 N. H.	Burge Beard

POLITICAL SCIENCE

(See also ECONOMICS, HISTORY, and SOCIOLOGY.)

JAMES WILFORD GARNER, Ph.D., *Professor*

JOHN ARCHIBALD FAIRLIE, Ph.D., *Professor*

JOHN MABRY MATHEWS, Ph.D., *Assistant Professor*

RUSSELL McCULLOCH STORY, A.M., *Instructor*

ROBERT EUGENE CUSHMAN, A.M., *Instructor*

Major: Twenty hours from any courses offered by the department. A major may include three hours of constitutional history (History 4 and 14).

Minors: Twenty hours, selected from two of the following subjects: history, economics, law, sociology, philosophy, and education.

Courses for Undergraduates

NOTE: Courses 1 and 3 give a survey of national, state, and local government in the United States, and should be taken by students specializing in politi-

Political Science

cal science. Course 1a is open only to students in the Colleges of Engineering and Agriculture who desire an introductory course in American Government.

1. American Government.—Historical development, organization, powers, limitations, and practical working of the national government. *I*; (3).

Prerequisite: Thirty hours of university work.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 1	3		I, Lecture	10	—	10	—	—	—	—	Mathews
			Quiz	—	—	—	—	9	—	—	Mathews
			Quiz	—	—	—	—	10	—	—	Mathews Story Story
			Quiz	—	—	—	11	—	—	—	
			II, Lecture	2	—	2	—	—	—	228 N. H.	Garner
			Quiz	—	—	—	—	1	—	—	Garner
			Quiz	—	—	—	—	2	—	—	Cushman
			Quiz	—	—	—	—	2	—	—	Garner Cushman

3. State and Local Government.—Powers, obligations, and rights of the states in the Federal Union; their formation and admission; development of state constitutions; organization of state and local government; political methods. (A continuation of course 1; may be taken independently.) *II*; (3).

Prerequisite: Thirty hours of university work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 3	3		I, Lecture	10	—	10	—	—	—	228 N. H.	Mathews
			Quiz	—	—	—	—	9	—	—	Mathews
			Quiz	—	—	—	—	10	—	—	Mathews Story Story
			Quiz	—	—	—	11	—	—	—	
			II, Lecture	2	—	2	—	—	—	—	Garner
			Quiz	—	—	—	—	1	—	—	Garner
			Quiz	—	—	—	—	2	—	—	Cushman
			Quiz	—	—	—	—	2	—	—	Garner Cushman

1a. American Government and Politics.—National, state, and local government. (Open only to students in the Colleges of Engineering and Agriculture.) *II*; (2).

Prerequisite: Thirty hours of university work. No credit is allowed for this course if the student has already had or subsequently takes course 1 or 3,

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 1a	2		—	—	11	—	11	—	—	317 L. H.	Cushman

16. Government of Illinois.—Constitutional development, organization, and administration of state and local government in Illinois; the legislature; the executive; the judiciary; state officers and institutions; county, town, and municipal government. Students in order to count both Political Science 3 and 16 for full credit must prepare in Pol. Sci. 16 a special report upon some phase of the government of Illinois. *I*; (2).

Prerequisite: Thirty hours of university work.

Political Science

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Political Science 16	2	—	—	—	9	—	9	—	—	202 L. H. Story

12. National Administration.—Administrative powers of the President and Congress; executive departments and administrative services of the national government; judicial administration and the relation of the courts to the executive authorities. *I*; (3).

Prerequisite: Political Science 1.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Political Science 12	3	—	—	1	—	1	—	1	—	317 L. H. Fairlie

13. State Administration in the United States.—The administrative position of the governor and the organization of the state administrative departments; administrative disintegration; the influence of the diffusion of the executive power upon the enforcement of state law; organization and powers of state boards, commissions, and quasi-judicial tribunals; tendencies toward centralization in the administration of taxation, education, and other state functions; methods of control over state administrative officers. *I*; (3).

Prerequisite: Political Science 3 or its equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Political Science 13	3	—	—	11	—	11	—	11	—	317 L. H. Mathews

14. Political Parties and Methods.—Development, organization, and methods in the United States and Great Britain; recent legislation on primary elections and corrupt practises. *I*; (2).

Prerequisite: One course in political science.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Political Science 14	2	—	—	—	10	—	10	—	—	317 L. H. Fairlie

Courses for Advanced Undergraduates and Graduates

(At least junior standing required)

4. Municipal Government.—The growth of cities; their legal and social position; municipal organization in the United States; the mayor and the council; commission government; the city manager plan; municipal organization abroad; municipal functions and problems. Lectures; assigned readings; reports. *I*; (3).

Prerequisite: One course in political science or Economics 1.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Political Science 4	3	—	—	8	—	8	—	8	—	202 L. H. Story

5. Constitutional Law of the United States.—The judicial interpretation of the Constitution; judicial power to declare laws unconstitutional; separation of governmental powers; relation between state and national government; fundamental rights under the constitution (due process of law, contract); territories and dependencies; national powers of taxation and commerce; jurisdiction of the courts. *I*; (4).

Prerequisite: Political Science 1.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 5	4	—	8	—	8	—	8	—	317 L. H.	Cushman

6. International Law.—The development, nature, source, and present status of the law of nations; the doctrine of intervention; the laws of war and peace; the rights and duties of neutrals; the arbitration movement. Lectures; assigned readings; reports. *I*; (3).

Prerequisite: Graduate or senior standing, or junior standing with six hours of history and five hours of political science.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 6	3	—	3	—	3	—	3	—	317 L. H.	Garner

7. American Diplomacy.—The genesis and present organization of the Department of State; the diplomatic service; the treaty making power; the methods and traditional principles of the foreign policy of the United States; diplomatic controversies with foreign powers; the United States as a world power. *II*; (3).

Prerequisite: Junior standing and Political Science 1 or History 3a-3b.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 7	3	—	2	—	2	—	2	—	317 L. H.	Mathews

9. Principles of Jurisprudence.—The nature, sources, and classification of law; historical development and comparison of the Roman and English legal systems; English common law in the United States; relation between statutes and judicial decisions. *II*; (2).

Prerequisite: Political Science 1 or its equivalent.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 9	2	—	—	10	—	10	—	—	317 L. H.	Fairlie

18. Legislation in the United States.—Nature of the legislative power; principles of representation; organization, procedure, and practise; bill drafting; reference bureaus; popular law making; tendencies in legislation. *II*; (3).

Prerequisite: Junior standing and six hours of political science.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 18	3	—	8	—	8	—	8	—	317 L. H.	Story

21. British Government.—Political institutions in the United Kingdom and the British possessions; the Crown; the Cabinet; the House of Commons; the House of Lords; the party system; the courts of law; local government; the Crown Colonies and the self governing colonies; recent developments and proposed changes. *I*; (3).

Prerequisite: Open to graduate students, seniors, and to juniors who have had six hours in political science.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 21	3	—	2	—	2	—	2	—	317 L. H.	Fairlie

Political Science

22. Continental European Governments.—The political systems of France, Germany, Austria-Hungary, Italy, and Switzerland; constitutional beginnings; political organizations; methods of legislation and administration; constitutional guaranties for the protection of individual rights. *II*; (3).

Prerequisite: Open to graduate students and seniors, who have had six hours in political science. History 20a-20b and Political Science 21 recommended.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 22	3	—	3	—	3	—	3	—	317 L. H.	Garner

23. Problems of Contemporary Politics.—Domestic and foreign politics; initiative, referendum, and recall; proportional representation; state socialism; immigration; electoral and ballot reform; judicial reform; parliamentary government; the Monroe Doctrine; international arbitration. Individual reports; discussion. *II*; (2).

Prerequisite: Senior standing and one course in political science.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 23	2	—	—	8	—	8	—	—	317 L. H.	Story

34. Municipal Problems.—Municipal administration in the United States and Europe; municipal organization and relations to the state; municipal ownership and regulation of public utilities; city planning and housing; police and sanitary administration; finances. Lectures; readings; special reports. *II*; (3).

Prerequisite: Open to graduate students and to undergraduates who have had Political Science 4.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 34	3	—	9	—	9	—	9	—	317 L. H.	Fairlie

36a-36b. Thesis Course.—For candidates for honors and other seniors doing research work. *I, II*; (2). *Time to be arranged.*

Courses for Graduates

101. History of Political Theories.—Ancient, medieval, and modern political thought; theories of Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Montesquieu, and others; evolution of American political ideas. Given in 1915-16 and alternate years. Alternating with course 102. *Twice a week*; *I*; (1 unit). *Time to be arranged.*

[102. The Nature of the State.—The principles, methods, and relations of political science; the origin, nature, forms, and functions of the state; sovereignty and liberty; citizenship and nationality; constitutions; principles and methods of political organization. Not given in 1915-16. *Twice a week*; *I*; (1 unit).
Professor GARNER]

103. Seminar in Political Science and Public Law.—Special problems; reports; discussions and criticism. The research work of candidates who are writing theses is under the direction of some instructor to whom they report frequently. *I, II*. *Time to be arranged.*

106. Special Topics in International Law.—Topics for 1915-16: War law; rights and duties of neutrals; contraband; right of search; capture; continuous voyage; transfers of flag; blockades. *Twice a week; II; (1 unit).* Time to be arranged. Professor GARNER

113. Special Topics in State Administration.—Administrative reorganization, development of newer functions; centralization and home rule; methods of law enforcement; relations between state, federal, and local agencies; investigation of problems. *Twice a week; II; (1 unit).* Assistant Professor MATHEWS

114. Special Topics in Public Administration.—Comparative studies in national, municipal, and local administration. Different topics in succeeding years. *Twice a week; II; (1 unit).* Professor FAIRLIE

PSYCHOLOGY

MADISON BENTLEY, Ph.D., *Professor*

CHRISTIAN ALBAN RUCKMICH, Ph.D., *Associate*

CARL RAHN, Ph.D., *Instructor*

ANNA SOPHIE ROGERS, A.M., *Graduate Assistant*

Major: Twenty hours chosen from courses announced by the department, except that six hours may be chosen from one or more of the following subjects: philosophy 1, 2, 3, 4; physics 1a-1b, 3a-3b, 7a-7b; zoology 2, 5, 9, 15; and animal husbandry 30.

Minors: Twenty hours chosen from education, genetics, philosophy, physics, physiology, sociology, and zoology.

1. Introduction to Psychology.—The facts and laws of consciousness. This course is preliminary to all the other work of the department. Lectures; sectional meetings. *I; (3).*

Prerequisite: One year of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	1	3	A, Lectures	9	—	9	—	—	—	410 U. H.	Bentley
			B, Lectures	—	9	—	9	—	—	410 U. H.	Bentley
			A	—	—	—	—	9	—	417 U. H.	Ruckmich Rahn
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	410 U. H.	
			D	—	—	—	—	10	—	417 U. H.	
			E	—	—	—	—	9	—	410 U. H.	
			F	—	—	—	—	9	—	418 U. H.	
			G	—	—	—	—	9	—	419 U. H.	
			H	—	—	—	—	—	10	420 U. H.	

2. General Psychology.—Mental inheritance, habit, custom, and fashion; the relations of psychology to the biological and social sciences; comparative and genetic psychology, and the psychology of the abnormal; applications of psychology to the arts and professions. *II; (3).*

Prerequisite: Psychology 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	2	3	Lectures	9	—	9	—	—	—	410 U. H.	Bentley
			A	—	—	—	—	9	—	417 U. H.	Ruckmich Rahn
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	410 U. H.	
			D	—	—	—	—	10	—	417 U. H.	

Psychology

3. Laboratory Practise (Elementary).—Classical experiments in the fields of sensation, feeling, attention, and action. A drill course in scientific method. *I* or *II*; (2).

Prerequisite: Psychology 1.

			FIRST SEMESTER								
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Psychology	3	2	A	2-4	—	2-4	—	—	—	507 U. H.	Ruckmich
			B	—	10-12	—	10-12	—	—	507 U. H.	—
			SECOND SEMESTER								
			A	2-4	—	2-4	—	—	—	507 U. H.	Ruckmich
			B	—	10-12	—	10-12	—	—	507 U. H.	Bentley

4. Laboratory Practise (Intermediate).—Experiments in memory, association, learning, and thought. A part of the term may be devoted either to the metrical methods of psychophysics or to the solution of a small qualitative problem. *I*; (2).

Prerequisite: Psychology 1 and 3.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	4	2	C	2-4	—	2-4	—	—	—	507 U. H.	Ruckmich

5. Comparative Psychology.—Mind in animal forms; the psychological implications of organic evolution; a comparison of human and animal minds; criticism of current literature. (Recommended to students who intend to elect advanced courses either in animal psychology or in the study of behavior). Lectures; laboratory. *I*; (2).

Prerequisite: Psychology 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	5	2	—	—	2-4	—	2-4	—	—	510 U. H.	Bentley

6. Comparative Psychology (Advanced Laboratory).—Individual studies in animal psychology. *II*; *(2-4).

Prerequisite: Psychology 1 and 5.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	6	*2 to 4	—	(Arrange)						510 U. H.	Bentley

8. Memory and Association.—The conditions of learning, retention, and recall; analysis of the associative consciousness. A survey of the field and an introduction to the methods of experimentation. Lectures; assigned reading; laboratory. *II*; (2).

Prerequisite: Psychology 1 and one other course.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	8	2	—	11	—	11	—	—	—	417 U. H.	Rahn

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-4, but 2, or 3, or 4.

9. Physiological Psychology.—Correlations between the structure and functions of the nervous system and the phenomena of human consciousness; a formulation of the problem of psychophysical relationship. Lectures; readings; discussions. *II*; (2).

Prerequisite: Psychology 1 and laboratory training in one of the biological sciences.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	9	2	—	10	—	10	—	—	—	507 U. H.	Rahn

10. German Reading.—Translation into English of a German psychological text. *I*; (1).

Prerequisite: Psychology 1 and an elementary knowledge of German.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	10	1	—	—	2	—	—	—	—	105 L. H.	Bentley

12-13. Minor Problems (Advanced Laboratory).—The formulation of methods suitable to new problems. *I, II*; *(2-5).

Prerequisite: Psychology 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	12	*2 to 5	—							507 U. H.	Bentley Ruckmich

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	13	*2 to 5	—							507 U. H.	Bentley Ruckmich

14. Social Psychology.—The social consciousness and the collective mind; analysis of the conditions upon which the social consciousness depends; perceptual, ideational, and emotional factors in the social consciousness; the genetic development of the collective mind as revealed in tradition and institutions. *I*; (2).

Prerequisite: Psychology 1 and one other course.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	14	2	—	11	—	11	—	—	—	417 U. H.	Rahn

15. The Psychological Basis of Music.—(An elementary course). Summary of experimental and theoretical literature on the origin of music, harmony, melody, rhythm, consonance, tonal quality; psychology of musical appreciation and performance. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	15	2	—	11	—	11	—	—	—	507 U. H.	Ruckmich

17. The History of Psychology.—The rise and development of the science of psychology. Lectures and reading in the sources. *II*; (2).

Prerequisite: Psychology 1, 2, and one other course.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Railway Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	17	2	—	11	—	11	—	—	—	507 U. H.	Ruckmich

19-20. Systematic Psychology.—The nature of psychological analysis; classification of elementary processes; description of sensory and imaginal processes and the simpler complexes based upon historical and current researches. Lectures and essays. (For graduates and advanced undergraduates). *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	19	3	—	—	9	—	9	—	9	417 U. H.	Ruckmich

SECOND SEMESTER

Psychology	20	3	—	—	8	—	8	—	8	417 U. H.	Rahn
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21-22. Special Studies.—Individual investigations, for advanced students, in the form of essay or of experiment. *I, II; (3).*

Prerequisite: Psychology 1, and one other course.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	21	3	—					(Arrange)		507 U. H.	Bentley Ruckmich Rahn

SECOND SEMESTER

Psychology	22	3	—					(Arrange)		507 U. H.	Bentley Ruckmich Rahn
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Courses for Graduates

103. Research.—Experimental and historical investigations. *I, II; (½ to 2 units). Time to be arranged.* Professor BENTLEY, Dr. RUCKMICH, Dr. RAHN

105. Seminar.—Discussion of current topics in their historical setting. *Once a week; I, II; (½ unit). Time to be arranged.*

PUBLIC SPEAKING

(See RHETORIC under THE ENGLISH LANGUAGE AND LITERATURE.)

RAILWAY ENGINEERING

WILLIAM FREEMAN MYRICK GOSS, M.S., D. Eng., *Director, Professor*

EDWARD CHARLES SCHMIDT, M.E., *Professor*

JOHN McBEATH SNODGRASS, B.S., *Assistant Professor, Railway Mechanical Engineering*

ALONZO MORRIS BUCK, M.E., *Assistant Professor, Railway Electrical Engineering*

ARTHUR FRANCIS COMSTOCK, C.E., *Associate, Railway Civil Engineering*

ROBERT BROWDER KELLER, B.S., *First Assistant, Engineering Experiment Station*

HAROLD HOUGHTON DUNN, B.S., *Assistant, Engineering Experiment Station*

Railway Civil Engineering—Courses 31-51.

Railway Electrical Engineering—Courses 60-68.

Railway Mechanical Engineering—Courses 1-10.

Common to all groups—Courses 25 and 30.

2. Locomotive Design.—Calculations and designs of engine and boiler details; current standards and proportions. Drafting room systems. *I*; (3).

Prerequisite: Mechanical Engineering 13, 7; Railway Engineering 6.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	2	3	W	1-4	—	1-4	—	1-4	—	103 T. B. Snodgrass

5. Railway Laboratory.—Locomotive testing; experimental work with electric and steam railway test cars, brakeshoe testing machine, drop testing machine and air-brake apparatus. *I*; (3).

Prerequisite: Railway Engineering 6; Mechanical Engineering 13, 7.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	5	3	W	—	8-11	—	11	—	8-11	105 T. B. Snodgrass

6. Locomotives.—Mechanics; performance; design. *II*; (4).

Prerequisite: Theoretical and Applied Mechanics 21, 29; registration in Mechanical Engineering 12 and 64.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	6	4	W	10	10	—	10	10	—	204 T. B. Schmidt

7. Advanced Design.—Problems in locomotive and car design. *II*; (3).

Prerequisite: Railway Engineering 2.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	7	3	W	—	8-11	1-4	8-11	—	—	103 T. B. Snodgrass

8. Dynamometer Car Tests.—Investigation of train resistance and locomotive tractive effort by the use of the railway test car. Analysis of the results and their application to the problems of tonnage rating. *II*; (2).

Prerequisite: Open to seniors in railway courses only.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	8	2	W	—	—	—	—	10	8-11	105 T. B. Keller

9. Seminar.—Discussion of current topics and review of railway journals; assigned topics and reports. *I*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	9	1	W	10	—	—	—	—	—	105 T. B. Schmidt Snodgrass

25. Railway Development.—History and organization of steam and electric railways; statistics; costs. *I*; (3).

Prerequisite: Open to juniors in railway courses only.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	25	3	—	10	—	10	—	10	105 T. B.	Schmidt Snodgrass Buck Comstock

Railway Engineering

30. Thesis.—Independent solution of some railway problem or the investigation of some subject. The thesis may consist of an original design or of an original experimental investigation, or it may be the analysis and discussion of facts already in existence. *II*; (3). *Time to be arranged.*

Professor SCHMIDT, Assistant Professor SNODGRASS, Assistant Professor BUCK, Mr. COMSTOCK, Mr. KELLER

31. Railway Yards and Terminals.—Theory of design; arrangement of grades in gravity yards; problems. *II*; (3).

Prerequisite: Civil Engineering 51.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	31	3	U	—	—	—	8	1-4	8	204 T. B.	Comstock

32. Railway Construction.—Advanced course in design of railway structures; study of cost analysis; preparation of estimates of cost, complete working drawings, and contracts and specifications for assigned problems in design. *I*; (3).

Prerequisite: Civil Engineering 51.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	32	3	U	1-4	—	1-4	—	9	—	204 T. B.	Comstock

33. Economic Theory of Railway Location.—Influence of volume of traffic, alignment, and gradient upon operating expenses; locomotive and grade problems; relocation of existing lines. *II*; (5).

Prerequisite: Civil Engineering 51; Theoretical and Applied Mechanics 20, 21.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	33	5	U	10	10	10	10	8-11	—	214 T. B.	Comstock

34. Railway Maintenance.—Systems; track design; standards and charts; classification of accounts; measuring efficiency; emergency organization. *II*; (4).

Prerequisite: Civil Engineering 51.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	34	4	U	9	—	1-4	9	—	9	214 T. B.	Comstock

35. Railway Signaling.—Block and route signaling; systems in current use; history of development; study of railway accidents. *I*; (1).

Prerequisite: Civil Engineering 51.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	35	1	U	—	—	10	—	—	—	105 T. B.	Comstock

Railway Engineering

50-51. Seminar.—Current topics; review of railway journals; assigned topics and reports. *I, II; (1).*

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Ry. E.	50	1	U	10	—	—	—	—	—	204 T. B.
Instructor Comstock										

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Ry. E.	51	1	U	—	—	9	—	—	—	214 T. B.
Instructor Comstock										

60. Electric Railway Principles.—Mechanics of traction; train resistance; braking of electric railway trains; methods of solving fundamental electric railway problems. *II; (2).*

Prerequisite: Theoretical and Applied Mechanics 25; Electrical Engineering 25, 22.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Ry. E.	60	2	—	—	8	—	8	—	—	105 T. B.
Instructor Buck										

61. Electric Traction.—Selection and operation of equipment. A condensed course for students in railway mechanical engineering or other engineering departments. *II; (3).*

Prerequisite: Theoretical and Applied Mechanics 21; Electrical Engineering 11, 62, or 25, 22.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Ry. E.	61	3	V	8	—	8	—	8	—	105 T. B.
Instructor Buck										

62. Electric Railway Laboratory.—Tests of electrical machinery used in railway service. *I; (2).*

Prerequisite: Railway Engineering 6.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Ry. E.	62	2	V	—	—	—	1-4	—	—	E. L.
Instructor Buck										

63. Electric Railway Laboratory.—(A continuation of Course 62). Tests with the electric test car and the steam dynamometer car to determine train resistance and power consumption. *II; (2).*

Prerequisite: Railway Engineering 62, 64.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Ry. E.	63	2	V	—	—	—	—	9-12	—	—
Instructor Buck										

64. Electric Railway Practise.—Types of equipment; energy consumption; methods of distribution. *I; (3).*

Prerequisite: Theoretical and Applied Mechanics 25; Electrical Engineering 5, 23.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Ry. E.	64	3	V	9	—	9	—	9	—	105 T. B.
Instructor —										

Romance Languages and Literature

65. Electric Railway Economics.—Location and operation; choice of systems; location of power plant and sub-stations; calculation of transmission and distribution of circuits; maintenance of way and of equipment; electrification of steam roads. *II*; (4).

Prerequisite: Railway Engineering 64.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	65	4	V	9	10	9	9	—	—	105 T. B.	Buck

66. Electric Railway Machinery.—Theory and characteristics of electrical machinery used for railway service, of transmission and distribution lines. *I*; (3).

Prerequisite: Railway Engineering 60.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	66	3	V	—	9	—	9	—	9	105 T. B.	Buck

67-68. Seminar.—Current topics; review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	67	1	—	11	—	—	—	—	—	105 T. B.	Buck

SECOND SEMESTER						
Ry. E.	68	1	—	(Arrange)	105 T. B.	Buck

Courses for Graduates

Entrance upon graduate work in railway engineering presupposes the full undergraduate course in that subject.

102. Locomotive Design.—Modern practise concerning steam pressure, compounding, superheating. *Time to be arranged.* Professor Goss

106. Locomotive Operation.—Train resistance and tractive effort; tonnage ratings. *Time to be arranged.* Professor SCHMIDT

103. Electric Railway Practise.—The design, selection, operation, and maintenance of equipment; central station, sub-station, rolling stock, and line equipment. *Time to be arranged.* Assistant Professor BUCK

110. Railway Location.—The effects of location upon earning capacity; problems in original location, in the relocation and reduction of grades of existing lines. *Time to arranged.* Mr. COMSTOCK

RHETORIC

(See ENGLISH.)

ROMANCE LANGUAGES AND LITERATURE

KENNETH MCKENZIE, Ph.D., *Professor*

*THOMAS EDWARD OLIVER, Ph.D., *Professor*

JOHN DRISCOLL FITZ-GERALD, II., Ph.D., *Professor, Spanish*

*On leave, first semester.

Romance Languages and Literature

DAVID HOBART CARNAHAN, Ph.D., *Associate Professor*

DAVID SIMON BLONDHEIM, Ph.D., *Assistant Professor*

ARTHUR ROMEYN SEYMOUR, Ph.D., *Associate*

OLIN HARRIS MOORE, Ph.D., *Associate*

CHARLES SERAPHIN CARRY, *Assistant*

LOUIS ALLEN, A.M., *Assistant*

JAMES KESSLER, A.M., *Assistant*

RAFAEL ARCANGEL SOTO, A.B., *Assistant*

ERIC ALLEN DAWSON, A.M., *Assistant*

GARIBALDI LAGUARDIA, A.M., *Assistant*

HERBERT KING STONE, A.B., *Assistant*

JOHN RAYMOND SHULTERS, A.M., *Assistant*

FRENCH

Major: 20 hours of French, exclusive of French 1a, 1b, 2a, 2c, 2d, 9a, and 9b.

Minors: 20 hours in not more than three of the following subjects: English (excluding Rhetoric 1-2), German, Greek, Italian, Latin, Spanish, history, and philosophy, provided that 8 hours must be taken in one subject other than a Romance language.

ROMANCE LANGUAGES

Major: 20 hours in French and one other Romance Language, exclusive of French 1a, 1b, 2a, 2c, 2d, 9a, 9b, Spanish 1a, 1b, and Italian 1a, and 1b.

Minors: 20 hours in not more than three of the following subjects: English (excluding Rhetoric 1-2), German, Greek, Italian, Latin, Spanish, history, and philosophy, provided that the minor does not include any language contained in the major in Romance Languages.

A. FRENCH

Courses for Undergraduates

1a-1b. Elementary Course.—Grammar; pronunciation; reading of modern authors; composition; conversation. *I, II; (4).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	1a	4	A	—	8	8	8	8	—	—	Kessler
			B	—	8	8	8	8	—	—	Allen
			C	—	8	8	8	8	—	—	Stone
			D	—	9	9	9	9	—	208 U. H.	Moore
			E	—	9	9	9	9	—	206 U. H.	Kessler
			F	—	10	10	10	10	—	—	Allen
			G	—	10	10	10	10	—	—	Carry
			H	—	10	10	10	10	—	208 U. H.	Dawson
			J	—	11	11	11	11	—	208 U. H.	Moore
			K	1	1	1	1	—	—	207 U. H.	Dawson
			L	1	1	1	1	—	—	208 U. H.	Allen
			M	2	2	2	2	—	—	208 U. H.	Stone
			(For students in Engineering.)								
R	—	8	8	8	8	—	—	Dawson			
S	—	11	11	11	11	—	422 E. H.	Stone			
T	2	2	2	2	—	—	219 E. H.	Carry			

SECOND SEMESTER

French 1b 4 Sections and schedule the same as for 1a (first semester).

Romance Languages and Literature

2a-2b. Modern Prose, Poetry, and Drama.—Rapid reading of modern authors; advanced syntax and composition. *I, II; (4).*

Prerequisite: French 1a-1b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	2a	4	A	—	8	8	8	8	—	208 U. H.	Moore
			B	—	9	9	9	9	—	207 U. H.	Blondheim
			C	—	10	10	10	10	—	207 U. H.	Kessler
			D	—	11	11	11	11	—	207 U. H.	—
			E	2	2	2	2	—	—	207 U. H.	Carnahan

SECOND SEMESTER

French 2b 4 Sections and schedule the same as for 2a (first semester).

2c-2d. Second-Year Conversation.—Mainly classroom work. (Does not count toward a major in French.) *I, II; (1).*

Prerequisite: French 1a-1b, with a grade of at least 85.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	2c	1	—	—	9	—	9	—	—	117 L. H.	Carry

SECOND SEMESTER

French 2d 1 — Schedule the same as for 2c (first semester).

3a-3b. Intermediate Composition and Conversation.—Conducted entirely in French, giving facility in idiomatic expression in writing and speaking. Reading; themes; talks upon France and French life. *I, II; (2).*

Prerequisite: French 2a-2b.

NOTE: Required of those who are given the recommendation of the department to teach French.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	3a	2	—	—	11	—	11	—	—	211 L. H.	Carry

SECOND SEMESTER

French 3b 2 — Schedule the same as for 3a (first semester).

4a-4b. Advanced Composition and Conversation.—French life and literature. Idiomatic constructions; syntax; themes. Conducted entirely in French. *I, II; (2).*

Prerequisite: French 3a-3b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	4a	2	—	11	—	11	—	—	—	211 L. H.	Carry

SECOND SEMESTER

French 4b 2 — Schedule the same as for 4a (first semester).

9a-9b. Masterpieces of Romance Literature in Translations.—Dante, Petrarch, Boccaccio, Cervantes, Rabelais, Montaigne, Moliere, and other writers. (May not be counted toward a major in French.) *I, II; (2).*

Prerequisite: Two years of university work.

Romance Languages and Literature

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	9a	2	—	—	2	—	2	—	—	211 L. H.	Moore

SECOND SEMESTER

French	9b	2	—	Schedule the same as for 9a (first semester).							
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22a-22b. Modern Novel and Drama.—The novel and drama in France from the beginning of the nineteenth century to the present time. Lectures; reports on collateral reading. *I, II; (2).*

Prerequisite: French 2a-2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	22a	2	—	—	10	—	10	—	—	211 L. H.	Fitz-Gerald

SECOND SEMESTER

French	22b	2	—	Schedule the same as for 22a (first semester).							
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25. Course for Teachers.—Methods of teaching French in this country and abroad; actual contact with class-room problems. *I; (2).*

Prerequisite: Twenty-four hours' credit in French, including French 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	25	2	—	—	9	—	9	—	—	211 L. H.	Carnahan

28a-28b. Senior Thesis.—For candidates for honors in French; open to other seniors. *I, II; (1).* *Time to be arranged.*

Courses for Advanced Undergraduates and Graduates

10a-10b. Survey of French Literature.—Special periods and authors. The main currents of French literature from the beginning to the present time. *I, II; (3).*

Prerequisite: French 22a-22b, or 24a-24b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	10a	3	—	9	—	9	—	9	—	211 L. H.	Carnahan

SECOND SEMESTER

French	10b	3	—	Schedule the same as for 10a (first semester).							
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17a-17b. Contemporary French Drama.—Study of the leading French dramatists from 1850 to the present time: Augier, Dumas fils, Becque, Brieux, Bourget, Bernstein, Rostand, Donnay, and others. *I, II; (2).*

Prerequisite: French 22a-22b, or 24a-24b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	17a	2	—	—	—	10	—	10	—	117 L. H.	McKenzie

SECOND SEMESTER

French	17b	2	—	Schedule the same as for 17a (first semester).							
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Romance Languages and Literature

24b. Seventeenth and Eighteenth Century Dramatists.—Corneille, Racine, Molière, Voltaire, Marivaux, Sedaine, Beaumarchais. Lectures and interpretation. *II; (2).*

Prerequisite: French 3a-3b, or 22a-22b. (In special cases French 2a-2b, with the consent of the department).

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
French	24b	3	—	9	—	9	—	9	—	218 L. H. Oliver

26a-26b. French Literary Criticism.—History of criticism in antiquity and in the Italian Renaissance; the principal French critics. The development of classicism and romanticism in the seventeenth and the nineteenth centuries. *I, II; (2).*

Prerequisite: Three years of French, and the consent of the instructor.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
French	26a	2	—	—	10	—	10	—	—	117 L. H. Blondheim

SECOND SEMESTER										
French	26b	2	—	Schedule the same as for 26a (first semester).						

Courses for Graduates

Candidates for an advanced degree in Romance languages must have a total of at least thirty hours of college work in these languages of which eighteen must be in either French, Italian, or Spanish; with at least twelve hours in French. A candidate must also have had satisfactory training in Latin, and be able to read German prose.

Graduate students who select Romance languages as a first or second minor must have had at least sixteen hours of college work in the language desired and be able to read German prose.

101. Old French Epic Literature.—Critical reading and interpretation of national and courtly epics and collateral study of their history. *Twice a week. II; (1 unit). Time to be arranged.* Professor OLIVER

104. Eighteenth Century Prose Writers.—Society, culture, and prose literature of the eighteenth century; the attack upon the classic ideals; growth of the revolutionary spirit; first movements towards romanticism. Readings; collateral study. *Once a week; II; (½ unit). Time to be arranged.*

Professor OLIVER

106. Early French Drama.—Origins and development to the Renaissance. *Twice a week; I, II; (1 unit). Time to be arranged.*

Associate Professor CARNAHAN

110. Introduction to Romance Philology.—Historical phonology and morphology. Linguistic problems of the teacher of French, Italian, and Spanish. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
French	110	1 unit	—	3	—	3	—	—	—	Fitz-Gerald

119. Old French Phonology and Morphology.—Development of Old French from Vulgar Latin. *Twice a week; I, II; (1 unit). Time to be arranged.* Assistant Professor BLONDHEIM

Romance Languages and Literature

120. French Lexicography.—Old French word-history. *Once a week; I, II; (½ unit). Time to be arranged.* Assistant Professor BLONDHEIM

125. Seminar.—Research work in preparation for theses. *Twice a week; I, II (1 unit). Time to be arranged.*

B. ITALIAN

Course for Undergraduates

1a-1b. Elementary Course.—Grammar; composition; conversation; reading. *I, II; (3).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Italian	1a	3	—	11	—	11	—	11	—	117 L. H.
Instructor McKenzie										

SECOND SEMESTER										
Italian	1b	3	—	Schedule the same as for 1a (first semester).						

Course for Advanced Undergraduates and Graduates

2a-2b. Italian Literature.—Italian writers of the nineteenth century. *I, II; (2). Time to be arranged.* Dr. MOORE

Prerequisite: Italian 1a-1b.

Course for Graduates

140. Italian Literature of the Thirteenth and Fourteenth Centuries.—Dante, Petrarch, Boccaccio. *Twice a week; I, II; (1 unit). Time to be arranged.* Professor MCKENZIE

C. SPANISH

Courses for Undergraduates

1a-1b. Elementary Course.—Grammar; pronunciation; reading; composition; conversation. *I, II; (4).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Spanish	1a	4	A	—	8	8	8	8	—	207 U. H.
			B	—	8	8	8	8	—	206 U. H.
			C	—	9	9	9	9	—	310 U. H.
			D	—	10	10	10	10	—	206 U. H.
			E	—	11	11	11	11	—	206 U. H.
			(Primarily for students in Engineering)							
			R	—	8	8	8	8	—	—
			S	2	2	2	2	—	—	400 E. H.
Instructor Soto										
Laguardia										

SECOND SEMESTER										
Spanish	1b	4	—	Schedule the same as for 1a (first semester).						

2a-2b. Conversation and Composition.—Conversation; composition; reading of modern prose with practical vocabulary. Commercial correspondence. *I, II; (3).*

Prerequisite: Spanish 1a-1b.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Spanish	2a	3	—	9	—	9	—	9	—	117 L. H.
Instructor Seymour										

SECOND SEMESTER										
Spanish	2b	3	—	Schedule the same as for 2a (first semester).						

Sociology

3a-3b. Introduction to Spanish Literature.—Rapid reading of modern authors, and of the more important writers of the seventeenth century. *I, II; (3).*

Prerequisite: Spanish 1a-1b.

FIRST SEMESTER.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	3a	3	—	10	—	10	—	10	—	212 L. H.	Fitz-Gerald

SECOND SEMESTER

Spanish	3b	3	—	Schedule the same as for 3a (first semester).							
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4a-4b. Business Correspondence and Conversation.—Reading of facsimile business correspondence; writing of business letters; conversation. Reports in Spanish on consular and governmental documents. Conducted in Spanish. *I, II; (2). Time to be arranged.* Dr. SEYMOUR

Prerequisite: Spanish 2a-2b.

Courses for Advanced Undergraduates and Graduates

11a-11b. The Spanish Drama of the Sixteenth and Seventeenth Centuries.—Earlier dramatists; representative plays of Lope de Vega, Calderon, Ruiz de Alarcon and Triso de Molina. Reports on outside reading. *I, II; (2). Time to be arranged.* Dr. SEYMOUR

Prerequisite: Spanish 3a-3b.

Courses for Graduates

132. The Novela of the Golden Age.—Political and social conditions in Spain from 1560 to 1700; prose fiction of this period; *Don Quixote* and the *Novelas Exemplares* of Cervantes. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	132	1 unit	—	—	3	—	3	—	—	212 L. H.	Fitz-Gerald

135. The Modern Novel in Spain.—The development of the modern novel in Spain from the middle of the nineteenth century to the present time. The development of the novel in Spain, France, and Italy. Lectures; collateral reading. *Twice a week; I, II; (1 unit). Time to be arranged.* Dr. SEYMOUR

SCANDINAVIAN LANGUAGES AND LITERATURE

(See GERMANIC LANGUAGES AND LITERATURE.)

THE SOCIAL SCIENCES

(See ECONOMICS, HISTORY, POLITICAL SCIENCE, and SOCIOLOGY.)

SOCIOLOGY

EDWARD CARY HAYES, Ph.D., *Professor*

JAMES GARFIELD STEVENS, Ph.D., *Instructor*

GORDON WATKINS, A.M., *Assistant*

A major in sociology may be made up from any of the courses for undergraduates in the following announcement.

The minor subjects may be selected, with the approval of this department, from the following: history, economics, political science, philosophy, and psychology. All candidates must have taken elementary psychology.

Courses for Undergraduates

1. The Principles of Sociology and Their Application to Present Problems.—I; (3).

Prerequisite: Junior standing.

Subject	No. Credits		Section	FIRST SEMESTER							Room	Instructor
	1	2		M	T	W	T	F	S			
Sociology	1	2	A	8	—	8	—	8	—	306 L. H.	Hayes	
			B	9	—	9	—	9	—	306 L. H.	Watkins	
			C	10	—	10	—	10	—	306 L. H.	Hayes	
			D	11	—	11	—	11	—	306 L. H.	Watkins	

7. The Social Problems of the Rural Community.—II; (2).

Prerequisite: Junior standing.

SECOND SEMESTER											
Subject	No. Credits		Section	M	T	W	T	F	S	Room	Instructor
Sociology	7	2	Lecture	—	11	—	—	—	—	202 L. H.	Hayes
			A, Quiz	—	—	—	11	—	—	306 L. H.	Watkins
			B, Quiz	—	—	—	—	—	11	306 L. H.	Watkins
			C, Quiz				(Arrange)			306 L. H.	Watkins

Courses for Advanced Undergraduates and Graduates

2. **Social Control.**—The methods by which society controls the conduct, opinions, and sentiments of its members. I; (3).

Prerequisite: Sociology 1.

				FIRST SEMESTER							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	2	3	—	—	11	—	11	—	11	306 L. H.	Hayes

3. **Social Evolution.**—Modes of social activity among savage, barbarous, and civilized people; family organization, practical arts, economic wants and institutions, origins of government and law, codes of morality, religions; inductions from such facts, as to the theory of social evolution and the method of progress. II; (3).

Prerequisite: Sociology 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	3	3	—	11	—	11	—	11	—	306 L. H.	Hayes

Sociology

8. Charities.—Evolution of modern organized philanthropy, public and private; causes and prevention of poverty; organization and management of charitable institutions. *I*; (3).

Prerequisite: Junior standing and Sociology 1 or Economics 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Sociology	8	3	A	8	—	8	—	8	—	306 L. H.
			B	—	9	—	9	—	9	306 L. H.
										Instructor
										Stevens
										Stevens

9. Criminology.—Nature, causes, and treatment of the criminal; evolution of modern methods of criminal procedure and penology; recent experiments and tendencies. *II*; (3).

Prerequisite: Senior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Sociology	9	3	A	8	—	8	—	8	—	306 L. H.
			B	9	—	9	—	9	—	—
										Instructor
										Stevens
										Stevens

10. Population.—Theories and policies of population; Malthus' Principle and its critics; problems in population of the United States; immigration, race-mixture, conditions affecting public health, death-rate, birth rate, "race-suicide", marriage, divorce; selective influences at work on the "Population type". *I*; (3).

Prerequisite: Senior standing and Sociology 1 or Economics 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Sociology	10	3	—	3	—	3	—	3	—	306 L. H.
										Instructor
										Stevens

[11. Principles of Sociology.—Principles and teachings of sociology, derived from analysis and classification of the elements that make up the life of a people, types of change to which they are subject, and causes by which they are affected. *I*; (3). (Not given in 1915-16.)

Prerequisite: Senior standing.]

[15. The Family.—Evolution of the family and marriage; its educational, moral, and political significance at different stages of social development. *II*; (3). Not given in 1915-16.]

14. Social Statistics.—Social investigation and research. Social and community surveys. The verification of sociological laws and principles by the statistical method. Vital statistics and population in the light of data afforded by official publications and special investigations. The statistical method applied to sociology and social problems. *II*; (3).

Prerequisite: Senior standing and Sociology 1 or Economics 1, and, except in special cases, Sociology 10.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Sociology	14	3	—	3	—	3	—	3	—	306 L. H.
										Instructor
										Stevens

Courses for Graduates

Preparation for graduate work in sociology must include the equivalent of twelve semester hours in the social sciences, of which at least three must be in sociology, and three in the principles of economics. The remainder may be in any combination of these two subjects, or of history and political science.

[101. **Sociological Method.**—Methods of advancing the science of sociology; adaptability to sociological investigation of methods described in Pearson's *Grammar of Science*, Wundt's *Methodenlehre*, zweite abtheilung, Seignobos' *La Méthode Historique Appliquée aux Sciences Sociales*, Bernheim's *Historische Methode*, Spencer's *Study of Sociology*, and Giddings' *Inductive Sociology*. *Three times a week; I; (1 unit)*. Not given in 1915-16.]

102. **The Development of Sociology.**—Reading of sociological works; discussions; lectures. *Twice a week; I, II; (1 unit)*. *Time to be arranged*.

Professor HAYES

150. **Seminar.**—Detection and statement of problems. Preparation of theses. *Twice a week; I, II; (1 or 2 units)*. *Time to be arranged*.

Professor HAYES

SPANISH

(See ROMANCE LANGUAGES AND LITERATURE.)

TRANSPORTATION

ERNEST RITSON DEWSNUP, A.M., *Professor*

Courses for Undergraduates

1. **Transportation System of the United States.**—The development and economic problems of railway and other transportation in this country. *I; (3)*.

Prerequisite: Economics 1 and 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	1	3	—	10	—	10	—	10	—	210 Com.	Dewsnup

2. **Transportation Policy in Europe and in the United States.**—The regulation of railways in the United States and Europe. *II; (3)*.

Prerequisite: Transportation 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	2	3	—	10	—	10	—	10	—	210 Com.	Dewsnup

7. **Railway Organization.**—The departments and functions of the American railway; the traffic and operating departments; relative merits of the departmental, divisional and unit systems of operating organization; organizations of foreign railways; railway associations, labor, discipline, and training. *I; (2)*.

Prerequisite: Accountancy 1 and Economics 1, previously or concurrently.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	7	2	—	—	10	—	10	—	—	210 Com.	Dewsnup

12. **Freight Shipment.**—Preparation of goods for shipment, freight classifications, class ratings, etc. The express and parcel post systems. *II; (2)*.

Prerequisite: For railway administration students Economics 1, concurrent registration in Economics 3, and credit or concurrent registration in Accountancy 1; for others Economics 1 and 3, Accountancy 1.

Veterinary Science

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	12	2	—	—	10	—	10	—	—	210 Com.	Dewsnup

13. Railway Traffic Administration.—Methods of passenger traffic management. *I*; (3).

Prerequisite: Credit or concurrent registration in Transportation 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	13	3	—	9	—	9	—	9	—	210 Com.	Dewsnup

[17. Railway Terminal Management.—Freight and passenger terminals. *I*; (3). Not given in 1915-16.

Prerequisite: Credit or concurrent registration in Transportation 1.]

22. Railway Train Service.—The standard code of train rules; its application to train dispatching; block-signaling practise; time-table construction. *II*; (3).

Prerequisite: Credit or concurrent registration in Transportation 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	22	3	—	9	—	9	—	9	—	210 Com.	Dewsnup

[26. The Economics of Railway Construction and Maintenance.—The bearing of traffic conditions upon location and types of construction; the present maintenance policy of the railways in regard to roadway and equipment. *II*; (3). Not given, 1915-16.

Prerequisite: Credit or concurrent registration in Transportation 2.]

35a-35b. Thesis.—Only students specializing in railway administration may register in this course. Full senior standing is required. *I, II*; (2). *Time to be arranged.* PROFESSOR DEWSNUP

Courses for Graduates

[101. Railway Rate Policy.—Theory and practise of railway rate making; government regulation of rates. *Twice a week; I*; (1 unit). Not given, 1915-16.]

102. The Significance of the Financial Policy of American Railways.—Railway capitalization and regulation, rates, physical valuation, and inter-railway finance. *Twice a week; II*; (1 unit).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	102	1 unit	—	—	9	—	9	—	—	210 Com.	Dewsnup

103. The Literature of Railway Economics.—Critical reading, beginning with Dr. Lardner's *Railway Economy of 1850*. *Twice a week; I*; (1 unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	103	1 unit	—	—	9	—	9	—	—	210 Com.	Dewsnup

VETERINARY SCIENCE

(Owing to the resignation of Dr. McINTOSH, the courses in veterinary science are temporarily withdrawn.)

ZOOLOGY

HENRY BALDWIN WARD, Ph.D., *Professor*
 JOHN STERLING KINGSLEY, D.Sc., *Professor*
 FRANK SMITH, A.M., *Professor*
 CHARLES ZELENY, Ph.D., *Professor*
 VICTOR ERNEST SHELFORD, Ph.D., *Assistant Professor*
 HARLEY JONES VANCLEAVE, Ph.D., *Instructor*
 HENRY GUSTAV MAY, B.S., *Research Assistant*
 BESSIE ROSE GREEN, A.M., *Assistant*
 HARRY VIRL HEIMBURGER, A.B., *Assistant*
 JESSE LEROY CONEL, A.M., *Assistant*
 EDWIN BOOTH POWERS, A.M., *Assistant*
 THOMAS BYRD MAGATH, M.S., *Graduate Assistant*
 GEORGE MARSH HIGGINS, B.S., *Graduate Assistant*
 RACHEL ANN BAUMGARTNER, A.B., *Graduate Assistant*
 JAMES ERNEST KINDRED, A.M., *Graduate Assistant*
 ROBERT HILLS KINGMAN, A.M., *Graduate Assistant*

Major: 20 hours from any courses offered in the department, excluding Zoology 1, and including Zoology 3, 4, and 5.

Minors: 20 hours chosen from two or three of the following subjects: animal husbandry (Animal Husbandry 30), bacteriology, botany, chemistry, entomology, physics, physiology, psychology, paleontology, and physiography.

Courses 1 and 2 constitute an introduction to later work in zoology. In the second year, a student may choose as a line of work either morphological, experimental, ecological, faunistic, or systematic courses. The courses on microscopical technique (3), heredity and evolution (5), and current literature (20) are of value for all students. Medical students should take courses 3 and 6 the second year. Those preparing to teach zoology in the high school should take invertebrate morphology (4), field zoology (16, 17), and ecology (9, 11), and a course in general entomology.

Courses for Undergraduates

1. General Zoology.—Animal biology; principles of structure; function, inter-relations, origin, and development of animal life; the simpler and best-established generalizations in zoological theory. Lectures; laboratory; quiz work. *I* or *II*; (5).

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	1	5	Lecture	9	—	9	—	9	—	228 N. H.	Ward
			E. Quiz	—	—	8	—	—	—		
			F. Quiz	—	—	—	—	8	—		
			G. Quiz	—	1	—	—	—	—		
			H. Quiz	—	—	—	1	—	—		
			A. Laboratory	—	8,9	—	8,9	—	8,9	312 N. H.	Shelford VanCleave and Assistants
			B. Laboratory	10,11	—	10,11	—	10,11	—	312 N. H.	
			C. Laboratory	1,2	—	1,2	—	1,2	—	312 N. H.	
			D. Laboratory	—	10,11	—	10,11	—	10,11	312 N. H.	

2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; the early stages of vertebrate embryology; structure of vertebrate

Zoology

tissues; anatomy of systems of organs considered in respect to their function, ontogeny, and evolution in the vertebrate series; anatomical studies of types of the Chordata. Lectures; laboratory; quiz work. *II*; (5).

Prerequisite: Zoology I.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	2	5	Lecture	10	—	10	—	10	—	229 N. H.	Kingsley
			A, Laboratory	8,9	—	8,9	—	8,9	—	403 N. H.	and
			B, Laboratory	—	10,11	—	10,11	—	10,11	403 N. H.	Assistants

4. Invertebrate Morphology.—Morphology of a series of invertebrates; invertebrate structure and development; the application of biological principles. Laboratory; lectures; demonstrations. *II*; (3).

Prerequisite: Zoology 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	4	3	—	—	1,2,3	—	1,2,3	—	—	312 N. H.	VanCleave

5. Heredity and Evolution.—(a) The facts of heredity and present views regarding them. (b) The proofs of organic evolution with a discussion of the probable factors involved in the process. Lectures; demonstrations; assigned reading. *II*; (2).

Prerequisite: One year of university work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	5	2	—	—	11	—	11	—	—	229 N. H.	Zeleny

16. Field Ornithology.—The birds of the vicinity. Identification; food relations; seasonal distribution; migration activities. (Students should provide themselves with opera or field glasses.) Field work; lectures. *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	16	2	Lecture	3	—	—	—	—	—	229 N. H.	Smith
			(Choose any two)								
			Fields	—	8,9	—	8,9	—	8,9	—	Smith
				—	3,4	3,4	—	3,4	—	—	Smith

19a-19b. Advanced Ornithology.—(Continuation of 16.) Difficult groups of birds; economic and technical literature. *I, II*; *(2 to 5). *Time to be arranged.*

Professor SMITH

Prerequisite: Zoology 16 or equivalent.

3. Microscopical Technique and Vertebrate Embryology.—Theory and practise of microscopical technique; vertebrate embryo in early stages of development; methods of fixation, embedding, section cutting, staining, and mounting; preparation of material for use in introductory embryology. Lectures; laboratory. *I*; (3).

Prerequisite: Zoology 1, 2.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	3	3	—	—	1,2,3	—	1,2,3	—	—	403 N. H.	Kingsley

6. Vertebrate Organogeny.—Development of the organs of the vertebrate body. Lectures; assigned readings; laboratory studies on embryos of the chick, dogfish, Amblystoma, and pig. (A continuation of course 3.) *II*; (3).

Prerequisite: Zoology, 1, 2, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	6	3	—	1,2	—	1,2	—	1,2	—	403 N. H.	Kingsley

7. Introduction to Human Anatomy.—The human skeleton; dissection of the dog and of the brain of man. *I*; (6).

Prerequisite: Zoology 1, 2.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	7	6	—	—	1-4	1-4	1-4	1-4	—	—	—

9. Animal Ecology.—The relations of animals to their natural environments. Field and experimental work; lectures on the natural history of mammals, birds, reptiles, and amphibians. *II*; (3).

Prerequisite: One year of zoology or one and one-half years of university work, including Zoology 1.

SECOND SEMESTER—FIRST HALF

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	9	3	Lecture	9	—	9	—	9	—	249 N. H.	Shelford

SECOND SEMESTER—SECOND HALF

Zoology	9	3	Laboratory	8,9	—	8,9	—	8,9	—	1210 Springfield Ave.	
			or Field	8,9	—	—	—	—	8-12		

11. Experimental Ecology and Geography.—The physiology of environmental relations; analysis of behavior. World and regional aspects of behavior and ecology; animal distribution as related to climate and vegetation. *I*; *(2 or 4).

Prerequisite: One year of zoology and senior standing.

FIRST SEMESTER—FIRST HALF

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	11	*2 or 4	Lecture	—	—	4	—	4	—	247 N. H.	Shelford
			Laboratory	—	3-4	—	3-4	—	—	1210 Springfield Ave.	
			or Field	—	—	—	—	—	8-3		

FIRST SEMESTER—SECOND HALF

Lecture	—	4	4	4	4	—	247 N. H.	Shelford
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25-26. Experimental Zoology.—Experimental embryology; regeneration; heredity; variation; evolution. Laboratory; assigned reading; conference. *I, II*; (5).

Prerequisite: Two years of university work, including one year in zoological courses.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Zoology

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	25	5	—					(To be arranged)		314 N. H.	Zeleny

SECOND SEMESTER

Zoology	26	5	—	Schedule the same as for 25 (first semester).							
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17. Field Zoology.—Collection, preservation, and identification of common representatives of the lower vertebrates and of the various groups of land and fresh-water invertebrates (excluding insects) in the vicinity; identification work on living and preserved material from larger rivers and lakes; observations on the habits and life histories of selected forms. Field and laboratory work; assigned readings. *I*; (4).

Prerequisite: One year in zoology, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	17	4	—	—	8,9	—	8,9	—	8-12	—	Smith

18. Advanced Field Zoology.—Taxonomic or distributional problems in connection with the local fauna. (A continuation of course 17.) *II*; *(3 to 5).

Prerequisite: Zoology 17.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	18	*3 to 5	—					(Arrange)		316 N. H.	Smith

22-23. Morphology of Vertebrates.—The skeleton and the brain, the cranial nerves, and the eye and ear. Lectures; laboratory work; dissection of types. *I, II*; (4).

Prerequisite: Zoology 1, 2, 3, and 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	22	4	—					(Arrange)		403 N. H.	Kingsley

SECOND SEMESTER

Zoology	23	4	—	Schedule the same as for 22 (first semester).							
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21a-21b. Introduction to Zoological Research.—Morphology, life history, or reciprocal relations of invertebrate forms. Laboratory; conferences; assigned reading. *I, II*; *(2 to 5).

Prerequisite: One year in zoological courses, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	21b	*2 to 5	—					(Arrange)		308 N. H.	Ward

SECOND SEMESTER

Zoology	21b	*2 to 5						(Arrange)		308 N. H.	Ward
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20a-20b. Current Literature.—Presentation and discussion of the results of recent zoological investigation. (Open to all students of zoology; should be taken by those intending to graduate with a thesis.) *I, II*; (1).

Prerequisite: Three years of university work, including one year in zoology.

*In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	20a	1	—	—	—	—	—	3	—	229 N. H.	Zeleny

SECOND SEMESTER

Zoology	20b	1	—	Schedule the same as for 20a (first semester).							
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8a-8b. Thesis Investigation.—Individual work on assigned topics. *I, II; (5). Time to be arranged.* Members of the department.

Prerequisite: Two years in zoological courses.

Courses for Graduates

Students entering upon graduate study in the department of zoology should have had two years of undergraduate work in the subject. When chosen as a minor the courses listed for graduates and undergraduates must be preceded by at least one full year's undergraduate work in zoology. Work done at other institutions will be valued on conference with the head of the department.

102. Vertebrate Morphology.—The origin of vertebrates, the segmentation of the head, and the morphology of special systems. Lectures; required reading. *Twice a week; I; ($\frac{1}{2}$ unit). Time to be arranged.*

Professor KINGSLEY

[107. Parasitology.—Structure and life history of animal parasites; their relations to disease; origin and biological significance of parasitism. Conferences; assigned readings; demonstrations. *Twice a week; I, II; (1 unit).* Not given in 1915-16. To be given in 1916-1917].

[109-109a. Physiological Ecology.—The regulatory mechanisms of organisms; neutrality; osmotic pressure; immunity; and temperature in relation to natural environments. Given in 1914-15 and alternate years; not given in 1915-16. *II; ($\frac{1}{2}$ or 1 unit).* Assistant Professor SHELFORD]

110-110a. Economic Ecology.—The application of the principles of physiology and ecology to the problems of fisheries and pollution, insect pests and weather, forestry and conservation. Given in 1915-16 and alternate years. *110, II. Twice a week; ($\frac{1}{2}$ unit); 110a, assigned reading and reports; II; ($\frac{1}{2}$ unit). Time to be arranged.* Assistant Professor SHELFORD

111. Experimental Ecology.—The repetition of published experiments in physiology and ecology. The student selects a topic on animal reactions or on the measurement of osmotic pressure, temperature, acidity, or conductivity, with modern apparatus. *I, II; ($\frac{1}{2}$ to 2 units). Time to be arranged.*

Assistant Professor SHELFORD

115. Factors of Individual and Racial Development.—Experimental embryology; regeneration; heredity; variation; evolution. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	115	1 unit	—	—	3	—	3	—	—	229 N. H.	Zeleny

117. Faunistic Zoology.—Problems in taxonomy, distribution, and ecology; field work, conference, and lectures. Students have the advantage of the collections, library, apparatus, and operation of a natural history survey of

Zoology

the State now in progress at the University. *Twice a week; I, II; (1 to 2 units). Time to be arranged.* Professor SMITH

127. Theories of Animal Phylogeny.—Relations of groups of animals; signification of so-called intermediate forms; study of invertebrate larval forms and of theories of descent based on them. Lectures; assigned readings; laboratory. *I, II; (1 unit). Given in 1915-16 and in alternate years. Time to be arranged.*

121. Zoological Problems.—Individual research course. *I, II; (1 to 2 units). Time to be arranged.* Professor WARD

122. Vertebrate Morphology.—Individual research course. *I, II; (1 to 2 units). Time to be arranged.* Professor KINGSLEY

123. Faunistic and Systematic Zoology.—Individual research course. *I, II; (1 to 2 units). Time to be arranged.* Professor SMITH

124. Experimental Zoology.—Individual research course. *I, II; (1 to 2 units). Time to be arranged.* Professor ZELENY

125. Animal Ecology and Behavior.—Individual research course. *Time and credit to be arranged.* Assistant Professor SHELFORD

Learning and Labor

University of Illinois

ANNOUNCEMENT OF COURSES

SEPTEMBER, 1916

DIRECTIONS FOR REGISTRATION
REQUIREMENTS FOR GRADUATION
DESCRIPTION OF COURSES

PUBLISHED BY THE UNIVERSITY
URBANA

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REGISTRATION CALENDAR

1916-1917

First Semester

1916

Sept. 11-15, Mon. to Fri.	Entrance examinations (get program and permits at the Registrar's Office)
Sept. 13, Wed.	Scholarship examinations for second nominees
Sept. 18, 19, Mon., Tues.	Registration Days
Sept. 18, Mon., 7 p. m.	Examination for exemption from Rhetoric 1
Sept. 20, Wed., 8 a. m.	Instruction begun
Sept. 23, Sat.	Assignments in the Brigade posted (Engineering Building, 1st floor, west end)
Sept. 25, Mon.	Military Drill (Mil. 2) and Hygiene lectures (P. T. 1a and 9) begun
Sept. 30, Sat., 5 p. m.	Latest date for rebates in full and for change of study-list without fee
Oct. 16, Mon.	Assignment of vacant agriculture and household-science scholarships
Oct. 20, Fri., 5 p. m.	Latest date for removal of "incompletes" in Military and Physical Training
No. 18, Sat., 5 p. m.	Latest date for rebates of one-half fees
1917	
Jan. 31-Feb. 3, Wed. to Sat.	Entrance examinations (get program and permits at the Registrar's Office)

Second Semester

Feb. 5, 6, Mon., Tues.	Registration Days
Feb. 7, Wed., 8 a. m.	Instruction begun
Feb. 17, Sat., 5 p. m.	Latest date for rebates in full and for change of study-list without fee
Mar. 9, Fri.	Latest date for removal of "incompletes" in Military and Physical Training and for removal by seniors of first-semester failures
Apr. 7, Sat., 5 p. m.	Latest date for rebates of one-half fees

DIRECTORY OF REGISTRATION OFFICERS

Information Office.....157 Administration Building

Registrar's Office.....156 Administration Building

CHARLES MAXWELL McCONN, A.M., *Registrar*.

HARRISON EDWARD CUNNINGHAM, A.B., *Assistant Registrar*

LEVI AUGUSTUS BOICE, *Recorder*

IRA MELVILLE SMITH, LL.B., *Examiner*

GEORGE PHILIP TUTTLE, Jr., B.S., *Assistant Examiner*

NOTE: For high-school and normal-school credits, see Mr. Smith; for advanced standing from other colleges, see Mr. Tuttle; for University of Illinois grades and credits, see Mr. Boice.

OTHER GENERAL UNIVERSITY OFFICERS

Cashier

MARSH EVERETT THOMPSON.....156 Administration Building

Dean of Men

THOMAS ARKLE CLARK, B.L., *Dean*.....152 Administration Building

ARTHUR RAY WARNOCK, A.B., *Assistant Dean*..152 Administration Building

Dean of Women

FANNY COOK GATES, Ph.D.....102 Woman's Building

Adviser to Foreign Students

ARTHUR ROMEYN SEYMOUR, Ph.D.....153 Administration Building

High School Visitor

HORACE ADELBERT HOLLISTER, A.M.....253 Administration Building

Director of Physical Training for Men

GEORGE A. HUFF.....1 Gymnasium

Director of Physical Training for Women

LOUISE FREER, A.B., B.S.....110 Woman's Building

Commandant

Major ROBERT WALTER MEARNs, 12th Infantry....112 Engineering Building

Sergeant FREDERICK WILLIAM POST, U. S. A., Ret'd,

Administrative Assistant.....112 Engineering Building

OFFICERS OF COLLEGES AND SCHOOLS

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HOWARD VERNON CANTER, Ph.D., *Assistant Dean*.....304 University Hall

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NATHAN AUSTIN WESTON, Ph.D., *Acting Dean*....104 Commerce Building

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GENERAL DIRECTIONS FOR REGISTRATION

To Every Student:

You should at once look over the **HEADINGS**, at least, of **ALL** the paragraphs, numbered 1-29, which follow. It is certain that one or two of them, and probable that several others, are **OF VITAL IMPORTANCE** to **YOU** individually at this time.

1. New Students without Permits to Register

A new student *who has not yet secured a permit to register* should proceed at once to the Registrar's Office, 156 Administration Building, taking with him his credit statements from all former schools attended (high school, academy, normal school, or college).

EXCEPTIONS

The foregoing direction applies to all new students without permits except:

- (1) **LIBRARY SCHOOL STUDENTS**—see page 75.
- (2) **APPLICANTS FOR ADMISSION AS "SPECIAL STUDENTS"**—see paragraph 12.
- (3) **STUDENTS DROPPED FROM OTHER INSTITUTIONS**—see paragraph 8.
- (4) **FOREIGN STUDENTS**—see paragraph 9.

2. New Students with Permits to Register

A new student *who has already received a permit to register* need not go to the Registrar's Office, but will receive his study-list, together with further detailed instructions, at one of the following points, according to the college or school which his permit entitles him to enter:

College of Liberal Arts and Sciences, including the Curriculums in Journalism, Chemistry, Chemical Engineering, Household Science, and Medicine—opposite the main entrance of University Hall.

College of Commerce and Business Administration—opposite the main entrance of the Commerce Building.

College of Engineering, including the Curriculum in Ceramic Engineering—Engineering Hall.

College of Agriculture, including the Curriculum in Household Science—opposite the main entrance of the Agricultural Building.

School of Music—Room 202, University Hall.

College of Law—Room 206 Law Building.

Library School—Room 320, Library Building.

Graduate School—Room 109, Commerce Building.

3. Former Students in Attendance Last Semester

A former student *in attendance the second semester of the year 1915-16*, and in all respects in good standing (see paragraph 5), should call for his study-list at one of the points mentioned in paragraph 2, according to the college or school in which he is enrolled.

4. Former Students Not in Attendance Last Semester

A former student *not in attendance the second semester of the year 1915-16*, but in all respects in good standing (see paragraph 5), must first secure a permit to re-enter, if a man, from the Dean of Men, if a woman, from the Dean of Women, and must then obtain a study-list at the Registrar's Office.

5. Former Students Not in Good Standing

A former student, whether or not in attendance the preceding semester, *if not in good standing*, either—

(a) Because he has been in attendance a year as a *conditioned freshman* and has not removed his entrance conditions; or—

(b) Because he has been registered for two years as a *special student* without matriculating; or—

(c) Because he has been *dropped for poor scholarship* or *dismissed on disciplinary grounds*—may not register except upon the recommendation of the faculty of his college and with the approval of the Council of Administration, evidenced by a permit from the Secretary of the Council. Such a student should go first to see the dean or the assistant dean of his college.

A former student who has withdrawn from the University within the last three weeks of his last semester of attendance may register again only with the special permission of the Dean of Men or the Dean of Women.

6. Students Changing Colleges or Curriculums within the University

A student who desires to transfer from one college or school of the University of Illinois to another college or school of the University should (1) secure from the dean or director of the former college or school a statement of his record therein; (2) secure from the Registrar's Office a statement of his entrance credits; and (3) submit these papers to the dean of the college or the director of the school which he wishes to enter.

Any student who wishes to transfer from the curriculum in which he was registered the last semester to another curriculum *in the same college* should consult the dean or the assistant dean of his college.

7. Students with Advanced Standing

A student transferring from another university, a college, a normal school, or a junior college, should submit his credits from that institution, or his "Estimate of Advanced Standing," if he has already obtained an "Estimate" from the Registrar, to his adviser when consulting the latter about his course. Then, whether he has already had an "Estimate" made or not, he should call between October 1 and October 15 at the Registrar's Office to file a formal petition for transfer of credits. For the rules governing such transfers see the "*Regulations for the Guidance of Undergraduate Students*," Appendix I. It is impossible for the Registrar's Office to make up estimates of advanced standing on the registration days.

Students seeking credit for previous work done elsewhere than in recognized colleges, universities, normal schools, or junior colleges may apply for special examinations for advanced standing, which, if taken within sixty days after matriculation, are given without fee.

8. Students Dropped from Other Institutions

A student who has been dropped from another college or university, either for unsatisfactory scholarship or for disciplinary reasons, may be admitted to the University of Illinois only on the recommendation of the college which he

desires to enter, approved by the Council of Administration. A student in this case should first see the dean or the assistant dean of the college of his choice and learn in consultation with him whether or not it is probably worth his while to file a petition.

9. Foreign Students

Students from foreign countries should consult first the Adviser for Foreign Students, Room 153, Administration Building.

10. Students Earning Their Way

Students who are making their own expenses, either in whole or in part, during the school year, should state that fact to their advisers when making up their schedules. Experience has shown conclusively that such students should carry light work.

11. Persons Employed by the University

Any person in the regular employ of the University may be permitted to attend University classes for credit, provided he registers and pays a fee of \$7.50 for each study each semester.

12. Special Students

Persons over twenty-one years of age may be admitted as special students, provided they secure (1) the recommendation of the instructor whose course they wish to take, and (2) the approval of the dean of the college in which the course is given. They must give evidence that they possess the requisite information and ability to pursue profitably, as special students, their chosen subjects, and must meet the special requirements of the particular college in which they wish to enroll.

A special student is not matriculated and must pay a tuition fee of \$7.50 a semester in addition to the regular incidental fee of \$12.00 a semester.

No one may enroll as a special student in any college or school of the University for more than two years, except by special permission, application for which must be made through the dean of the college.

A person registered as a special student in one college and desiring to take a course in another college of the University must obtain the approval of the dean of the latter college.

A person desiring admission as a special student should first see the dean or the assistant dean of the college he wishes to enter (see the directory on pages 6 and 7).

13. Deficient Freshmen

Beginning in September, 1916, no student will be admitted to the University who offers less than fifteen units of high-school work in acceptable subjects or whose fifteen units fail to include certain subjects that are *prescribed* for all the colleges and schools of the University, namely, English, 3 units, Algebra, 1 unit, plane geometry, 1 unit, and physics or chemistry or zoölogy or botany or physiology, 1 unit. A student who offers fifteen units in acceptable subjects, including the six units named above, but is deficient not more than two units in subjects prescribed in addition for the individual college or school of his choice,* may be admitted in that college or school to courses for which he is prepared.

A deficient freshman pays an extra fee of \$7.50 each semester.

*For these special prescriptions for the several colleges and schools see the *Annual Register*, 1915-16, pp. 73, 74.

No student having entrance deficiencies may continue in the University for a second year, except on the recommendation of the faculty of the college or school in which he is enrolled, approved by the Council of Administration. Permission to continue as a deficient student will be granted only in very exceptional cases.

A student who has been registered for one year as a deficient freshman may, with the approval of the dean of his college, be permitted to register as a special student for one year, provided (1) that his age when he registered as a deficient freshman would have permitted him to enter as a special student at that time, and (2) that his average grade during the year of his attendance has not been less than 80.

14. Exemption from Rhetoric 1 by Examination

Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. An examination to test such proficiency will be given at 7:00 p. m. on the first day of registration (Monday, September 18) in room 228 Natural History Building. The results of this examination will be announced the following morning. Students who intend to try this examination should defer their registration until they learn whether or not they have passed in the examination.

15. Number of Hours* Prescribed

That the time of students may be fully occupied, each person is required to pursue studies aggregating *not less than fifteen nor more than eighteen hours**; except that students in curriculums requiring more than such number of hours in any semester are not limited as to such required hours by this rule: and excepting further that a student whose standing in each study of the preceding semester has been 90 may take for the semester studies aggregating not more than twenty hours. A student may be permitted to take more or less than the amount of work prescribed above only on the permission of the dean of his college or the director of his school.

A student who cannot devote his entire time to his studies because of illness, outside work necessary to meet expenses, or other good reason, may be required by the dean of his college or the director of his school to take less than fifteen hours.

16. Required Subjects Take Precedence

Any required subject in which there is a failure must upon the first recurrence of such subject take precedence over all other subjects.

17. Credit Forfeited by Reregistering

By reregistering or taking a special examination in a subject for which he has received credit, a student forfeits his credit. When a course is thus repeated the grade given at the end of the repetition or as the result of the special examination becomes the official grade.

18. Candidacy for Graduation

Candidates for graduation must have completed by the end of the first semester of the year of graduation all studies required therefor, except those to be taken in class in the second semester; provided, that a failure in the first semester's work may be made up not later than one month after the beginning of the second semester.

*Credit is reckoned in "semester hours," or simply "hours." An "hour" is one class period a week for one semester, each class period presupposing two hours' preparation by the student, or the equivalent in laboratory, shop, or drawing room.

19. Courses with Variable Credit

In registering for a course with variable credit hours (e. g., Agronomy 13, 2-5 hours), a student must put down on his study-list the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2 or 3 or 4 or 5.

20. Military and Physical Training For Men**(a) THE REQUIREMENT IN MILITARY**

All male students, citizens of the United States, except (1) students of the College of Law, (2) students over twenty-five years of age when entering the University, (3) students entering the University with junior standing, and (4) students who have had two years of military work at other institutions having a United States Army officer on duty as professor of military science, must register in military on entering the University, and, unless properly excused, must take the full course therein, whether they intend to graduate or not. To have any credits received for military work count for graduation, the full course must be taken. The classes of students excepted above may take military work if they so desire, by registering for it.

After registering in the military department, students physically disqualified, such disability to be certified by a reputable physician approved by the Council of Administration, may be excused from military work by petition submitted through the Military Office.

(b) THE REQUIREMENT IN PHYSICAL TRAINING (Men)

Freshmen take physical training throughout the year.

The Dean of Men may excuse from the required gymnasium practise such men students as are doing manual labor or present other legitimate reasons; he may also give permission to defer physical training for the current year.

(c) REGISTRATION IN MILITARY AND PHYSICAL TRAINING (Men)**First Semester**

Freshmen, first semester—register for *Military 2a* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Physical Training 1* (Gymnasium Practise) and *1a* (Personal Hygiene)* as for any other

Sophomores, not sergeants, first semester—register for *Military 2c* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday.

Sophomores who are sergeants, and junior and senior officers, first semester—register for *Military 2c* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 3a* (Advanced Theoretical Instruction) as for any other sectional course.

Second Semester

Freshmen, second semester—register for *Military 2b* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 1* (Theoretical Instruction) and *Physical Training 2* (Gymnasium Practise) as for any other sectional courses.

Sophomores, not sergeants, second semester—register for *Military 2d* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday.

**Physical Training 1a* (six lectures on Personal Hygiene by the Dean of Men) begins Monday, September 25, and extends through October, and *Physical Training 1* (Gymnasium Practise, two hours a week) begins the first week in November.

Sophomores who are sergeants, and junior and senior officers, second semester—register for *Military 2d* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 3b* (Advanced Theoretical Instruction) as for any other sectional course.

(d) ASSIGNMENT TO COMPANIES

Assignment to companies in the Brigade will be made by the Commandant.

The assignments in the Brigade will be posted on the Military Bulletin Board on the first floor of Engineering Hall, west end, outside room 112, on Saturday, September 23. Military drill will begin on Monday, September 25.

(e) UNIFORMS

All students registering in Military for the first time must report *on the registration days* at Room 104, Engineering Hall, to be measured for uniforms.

A deposit of \$14.20, the cost of the uniform, payable with the other fees at registration, is required of students registering in Military for the first time. Additional equipment costing \$6.75 must be purchased at the same time.

21. Physical Training for Women

Freshman women have Gymnasium Practise three hours a week throughout the year, and lectures on Hygiene by the Dean of Women at 4 o'clock on Monday throughout the first semester.

For the *first semester*, they should register for *Physical Training 9* (Hygiene) at 4 o'clock on Monday; and should register for *Physical Training 7a* (Gymnasium Practise) as they would for any other sectional course.

For the *second semester*, they should register for *Physical Training 7b* (Gymnasium Practise) as they would for any other sectional course.

The Dean of Women may excuse from the required gymnasium practise such women students as are doing manual labor or present other legitimate reasons; she may also give permission to defer physical training for the current year.

22. Late Registration

A late registration fee of one dollar is charged all former students registering later than the registration days.

23. Week Old Study-Lists Invalid

A study-list becomes invalid if not filed at the Business Office within one week after the date of its issue; in this case the student becomes subject to the provisions of paragraph 22.

24. Changes in Study-Lists

Permission to change study-lists after registration may be obtained only from the dean of the college or the director of the school in which the student is enrolled. No changes can be made on the registration days.

Changes in study-lists must be completed and filed at the Business Office not later than 5:00 p. m. of the tenth day of class work as scheduled (in the first semester, Saturday, September 30, 1916; in the second semester, Saturday, February 17, 1917) or a fee of \$1.00 will be charged for each change; provided that the total charge for the rearrangement provided for on any one change slip shall not exceed \$2.00.

25. Listeners or Visitors

(a) *Registered Students.* Permission to attend classes as listeners or visitors is granted to registered students only with the consent of the instructor of the class and with the approval of the dean of the college or the director of the school in which the student is enrolled. *Students who visit a course as listeners are not allowed an examination for credit.*

(b) *Persons in the Employ of the University.* Permission to attend classes regularly as visitors only may be granted, without fee, to persons in the employ of the University on the recommendation of the head of the department in which the employee is at work, with the consent of the instructor in the course, and with the approval of the dean of the college in which the course is given.

(c) *Persons Not Connected with the University.* Permission to attend classes regularly as listeners only may be given to persons who are not connected with the University, on the following conditions: (1) they must first secure the consent of the instructor concerned and of the dean of the college in which the course is given; (2) they must pay a fee of \$7.50 for each course attended.

No instructor is allowed to admit any listeners or visitors to any of his classes except on presentation of a visitor's card showing that he has complied with the foregoing conditions.

Visitors' permits should not be applied for on the registration days.

26. Fees Payable in Advance

All fees are payable in advance at registration.

A student who is in debt to the University at the end of any semester is not permitted to register in the University again, and is not entitled to receive an official statement of his credits from the Registrar, until his indebtedness has been discharged.

27. Hospital Fund

Every student should, on the registration days, join the Students' Mutual Benefit Hospital Fund. A payment of one dollar insures care in the local hospital, without hospital fees, for any period of illness not exceeding four weeks, during the semester. Apply at the office of the Dean of Men or of the Dean of Women.

28. University Honors

For information in regard to the University Honors open to students—Freshman Honors, Preliminary Honors, Special and Final Honors, and the A. B. Degree with Honors—see pp. 83, 84.

29. "Regulations"

Every student should obtain, at the office of the dean of his college or of the Dean of Men or the Dean of Women, a copy of the "*Regulations for the Guidance of Undergraduate Students*," should look it through, and should *keep it for reference.*

THE COLLEGE OF LIBERAL ARTS AND SCIENCES

I. DIRECTIONS FOR FRESHMEN

- (1) Read paragraphs 1, 2, 10, 13, 14, 15, 20, 21, 22, 27, 28, and 29, pages 9-15.
- (2) Obtain your study-list, (1) *if you already have a permit to register*, at the desk on the first floor of University Hall, opposite the main entrance; (2) *if you have not yet secured a permit to register*, at the Registrar's Office, 156 Administration Building.
- (3) Follow, *point by point*, the directions on the first coupon of the study-list.

ADVISERS

You will find the adviser who is to approve your study-list, according to the curriculum to be pursued, as designated on page 32.

STUDIES FOR FRESHMEN

The total number of hours for which any freshman registers may not be less than fifteen nor more than eighteen, including the required subjects, except by permission of the Assistant Dean, Room 304, University Hall. A student who cannot devote his entire time to his studies because of ill health, outside work necessary to meet expenses (see paragraph 10, page 11), or other good reasons, should consult with the Assistant Dean before registering.

1. *Required.*—All men who enter as freshmen must register for **Rhetoric 1* (first semester) and *2* (second semester), *Military 2a* (first semester) and *1 and 2b* (second semester), and *Physical Training 1* and *1a* (first semester) and *2* (second semester). All women who enter as freshmen must register for **Rhetoric 1* (first semester) and *2* (second semester) and for *Physical Training 7a* and *9* (first semester) and *7b* (second semester). Excuse from military or physical training may be secured for good reason *after registration* from the Dean of Men, Room 152, Administration Building, in the case of men, and from the Dean of Women, Room 102, Woman's Building, in the case of women. (*For directions for registering in Military and Physical Training see paragraphs 20 and 21, pages 13, 14.*) In addition to the above all freshmen (except those in the Medical Curriculum) must take *foreign language*. Freshmen whose major work is to be in one of the natural sciences and who have not had at least a one-year course in chemistry or physics in an accredited high school, should register for one or both of these subjects during the year.

2. *Elective.*—The subjects listed below are open to freshmen. *Do not register for any others.* Courses should be selected from at least *three of the five groups*, not counting art and design, household science, or library science.

Freshmen are advised not to register for more than one *beginning* course in foreign language at the same time, nor for more than two five-hour laboratory courses.

*Except those in the Curriculums in Chemistry and Chemical Engineering.

Students who wish to continue their study of Latin in the University are strongly urged to take Greek also. The Greek and Latin classics are important as a foundation for the study of modern literature, history, philosophy, and education. Students who wish to specialize later in history and politics are advised to take *History 1a* (first semester) and *1b* (second semester) in their freshman year.

Music.—Courses 1-14 in Music (see the Description of Courses beginning on page 85) may be counted for credit in this College. Others may be taken without credit. Students wishing to enter courses in music other than 1-14 must consult the Director of the School of Music, Room 202, University Hall, and secure from him a slip designating the course and the fee. This slip must be presented to the class adviser. The total number of hours including music must not exceed eighteen. Not more than sixteen hours of regular work should be entered upon the registration blank of freshmen who take music.

Law.—Students planning to enter the College of Law after two years of study in this College take the prescribed subjects: Rhetoric, military, physical training, foreign language (preferably Latin, if two or three units have been offered for entrance; German, if one or more units of German have been offered for entrance; or French, with or without entrance credit). They are advised to make up the rest of the schedule from among the following subjects: Economics, History, Mathematics (see page 73 for a recommended program, also page 74 for the combined curriculum for the A.B. and LL.B. degrees). *Courses in Law may not be taken by students enrolled in this College before the senior year. Consult advisers in Room 208, University Hall.*

For the description and time-table of each of the courses named below see the Description of Courses, beginning on page 85. The courses are arranged in alphabetical order by departments.

FIRST SEMESTER

- I. English 10¹ (3)²; Rhetoric 1 (3).
- II. French 1a (4) or 2a (4); German 1 (4) or 3 (4) or 4 (4) or 5 (4); Italian 1a (3); Greek 1a (4) or 3 (3); Latin 1a (4) or 2a (4) or 6 (4); Spanish 1a (4) or 2a (3) or 3a (2); Portuguese 1a (4).
- III. Economics 7 (3) and 26 (3); History 1a (4) or 2a (3).
- IV. Mathematics 2 (3) and 4 (2) [prerequisite: entrance algebra, 1½ units; plane geometry, 1 unit]; chemistry 1³ (5) or 1a³ (3); Physics 7a⁴ and 8a⁴.
- V. Botany 1³ (5), 4d (3); Entomology 1a (2), 15 (5); Geology 1 (5), 3³ (5), 14 (3); 35 (5); Zoology 1³ (5).
Household Science 2 (2) or 7a (2).
Library Science 12³ (2).
Art and Design 1³ (3).

SECOND SEMESTER

- I. English 11¹ (3)²; Rhetoric 2 (3).

¹English 10-11 is open only to freshmen who have presented the minimum amount of English required for admission. See the Description of Courses, pages 85ff.

²The figure immediately following the subject is the number of the course (see page 85); the figure in parenthesis indicates the number of credit hours to be secured in the course each semester.

³May be taken in either semester, but not in both.

⁴Prerequisite: Mathematics 4 (Trigonometry), which may be taken at the same time.

- II. French 1b (4) or 2b (4); German 1 (4) or 3 (4) or 4 (4) or 5 (4) or 6 (4) or 7 (4) or 12 (4); Greek 1b (4), 4 (4); Italian 1b (3); Latin 1b (4), or 2b (4); Spanish 1b (4) or 2b (3) or 3b (2); Portuguese 1b (4).
- III. Economics 22 (3) and 27 (3); History 1b (4) or 2b (3).
- IV. Mathematics 6 (5); Astronomy 4 (5); Chemistry 1³ (5) or 1a³ (3) or 2a (5); Physics 7b⁴ and 8b⁴ (5).
- V. Botany 1³ (5), 2b (5), 3b (5), 4 (3), 4a (5), 24 (3), 27b (5); Entomology 1b (2); Geology 1 (5), 22 (3), 35 (5); Zoology 2 (5), 1³ (5), or 16 (2).
Household Science 1 (3).
Library Science 12³ (2).
Art and Design 1³ (2).

DEFICIENT FRESHMEN

Deficient freshmen should see paragraph 13, page 11.

II. DIRECTIONS FOR STUDENTS OTHER THAN FRESHMEN

1. Read paragraphs 1-29, pages 9-15.
2. Students in attendance the second semester of 1915-16 and in good standing will obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Students not in college last semester or not in good standing see paragraphs 4 and 5, page 10.
3. For advisers to approve study-lists see page 32.
4. Follow, *point by point*, the directions on the first coupon of the study-list.
5. Students who have not completed their *military* and *physical training* requirements must register for these subjects. (See pages 13, 14.)
6. No student may take less than fifteen hours without special permission of the Assistant Dean, Room 304, University Hall, nor more than eighteen unless his standing in each of the studies of the previous semester was at least 90.
7. A student who cannot devote his entire time to his studies because of ill health or outside work necessary to meet expenses, or for other good reason, should consult with the Assistant Dean before registering.
8. Students should choose their *major subject*, indicating it on the registration blank, not later than at the beginning of the *junior* year. The study-lists of all *juniors* and *seniors* should be made up after consultation with the departments in which the major subject is chosen.
9. For the requirements in the various departments for *majors* and *minors* according to the *requirements for the A. B. degree* in general courses, see the Description of Courses, beginning on page 85, under the proper subject.

¹English 10-11 is open only to freshmen who have presented the minimum amount of English required for admission. See the Description of Courses, pages 85ff.

²The figure immediately following the subject is the number of the course (see page 85); the figure in parenthesis indicates the number of credit hours to be secured in the course each semester.

³May be taken in either semester, but not in both.

⁴Prerequisite: Mathematics 4 (Trigonometry), which may be taken at the same time.

10. *Music*.—For courses in music see the Description of Courses beginning on page 85, under Music. Courses 1 to 14 inclusive may be counted for credit in this College; also certain courses in practical music, exclusive of courses open to freshmen, to an amount not to exceed one-half of the total credit in music allowed any student.

Students wishing to enter courses in Music other than courses 1-14 must consult the Director of the School of Music, Room 202, University Hall, and secure from him a slip designating the course and the fee. This slip must be presented to the class adviser who will then add the course to the student's study-list, provided the total number of hours including music does not exceed eighteen.

11. *Education*.—Students who plan to teach should see the announcement of the School of Education, page 77.

12. *Library Science*.—Students who plan to take a library curriculum after graduation from this college should consult the Recommended Preliminary Curriculum outlined by the Library School, page 75.

13. *Law*.—Courses in law may not be taken by students enrolled in this College before their senior year.

Requirements for the A. B. Degree

A. *Prescribed Subjects*.—Rhetoric 1-2; Physical Training 1-2 and 1a for men; Physical Training 7a-7b and 9 for women; Military Science 1 and 2 for men.

B. *Group Requirements*.—Every candidate must offer the minimum of work specified in each of the following groups:

I. *English*.—The offering in this group must include at least one semester course in literature.

II. *Foreign Languages and Literatures* (exclusive of courses in translation).

If a student has offered but two units of a foreign language for entrance to the University, he must pursue the study of foreign language through two-year courses or the equivalent. If he has offered for entrance three or more units of foreign language, he must continue the study of foreign language through one year of his college course.

Note: Candidates for the degree who have not offered Greek or Latin or French or German for entrance must offer one of these languages for graduation.

III. *History, Political and Social Science*.—History, economics, political science, sociology: 8 hours.

IV. *Mathematics and Physical Science*.—Mathematics, astronomy (courses with college mathematics as prerequisites), physics, chemistry: 8 hours.

V. Botany (including bacteriology), entomology, geology, physiology, zoölogy: 8 hours.

VI. Education, philosophy, psychology: 6 hours, of which 3 shall be in philosophy or psychology.

C. *Major Subjects*.—Each candidate must select some one subject as his major. A major consists of courses amounting to 20 hours chosen from among those designated by a department and approved by the faculty of the col-

lege. Such courses are to be exclusive of those elementary or beginning courses which are open to freshmen, and inclusive of some distinctly advanced work. (At least five hours of the work accepted for a major must have been done in residence at this University and included within the maximum credits allowed in any one division.)

The subjects at present recognized as majors in this college are: Astronomy, bacteriology, botany, chemistry, classics, education, economics, English, entomology, French, geology, German, Germanic languages, Greek, history, household science, Latin, mathematics, philosophy, physiology, physics, political science, psychology, Romance languages, sociology, zoology.

D. *Minor Subjects.*—Each candidate must offer, in addition to his major, a minor of 20 hours in one or more allied subjects designated by the major department and approved by the faculty of the college. *At least 8 hours must be offered in one subject.*

E. *Elective Subjects.*—

1. Not more than 40 hours in any one subject may be counted for graduation, except: (a) in special courses approved by the faculty of the college; (b) when a student is writing a thesis, he may count, in addition to the 40 hours, the hours of the course in which he does his thesis work; (c) in the department of English a student may take 40 hours in addition to Rhetoric 1-2.

Note: The total credit in Art and Design is limited to 20 hours.

2. No credit is granted in any subject unless the student pursues it for the full time required in the shortest course offered in that subject. For example, if the student elects a course which yields two hours for one semester, he must stay in the class during one semester in order to get any credit at all. *In order to secure any credit in a beginning course in a foreign language, a full year's work must be completed.*
3. A limited amount of credit toward the A.B. degree is ordinarily given for courses offered in other colleges and schools of this University, as follows:

College of Agriculture:

Agricultural Extension 1 (High School Agriculture).

Agronomy 9 (Soil Physics), 11 (Soil Biology), 12 (Soil Fertility), 22 (Plant Breeding).

Animal Husbandry 7 and 31 (Animal Nutrition), 30 (Genetics).

Dairy Husbandry 11, 12a-12b (Dairy Bacteriology).

Horticulture 9 (Forestry), 12 (Horticultural Evolution), 36 (History of Landscape Gardening), 37a (Civic Design), 42 (Landscape Design).

The total credit allowed in agricultural courses may not exceed 14 hours.

College of Commerce and Business Administration:

Accountancy 1a-1b (Principles of Accounting), 13 (Municipal Accounting).

Business Organization 1 (Business Organization), 9 (Commercial and Civic Organizations).

Business Law 1a-1b (Commercial Law,—no credit given to students in the combined arts-law curriculum).

Economics, all courses except 9, 32, 34.

Transportation 1 (U. S. Transportation System), 2 (Transportation Policy).

College of Engineering:

- Architecture 13, 14, 15, 16 (History of Architecture), 31, 32 (Architectural Drawing).
 Civil Engineering 27 and 28 or 33 and 34 (Surveying), 94 (Highway Administration).
 Drawing, General Engineering 1 (Elements of Drafting), 2 (Descriptive Geometry).
 Electrical Engineering 4 and 64 or 8 and 68.
 Mechanical Engineering 11, 12 (Thermodynamics), 30 (Mechanics of Machinery).
 Mechanics, Theoretical and Applied, all courses.
 The total credit allowed in engineering courses may not exceed 24 hours.

College of Law:

- A student who has Senior standing in the College of Liberal Arts and Sciences may take and count the first full year of law work for thirty hours of credit toward the A.B. degree, or, if he takes and successfully carries less than the full amount, it shall be counted only hour for hour toward the A.B. degree.
- Law 14 (Carriers), 17 (Private Corporations), 24 (Municipal Corporations), 28 (Insurance), and 34 (Public Utilities), are open to students majoring in political science or economics who have had a previous course in law or political science involving the study of cases.
- Courses in law may not be taken before the senior year by students enrolled in this College, and in no case may the total credit for law course exceed 30 hours.

Library School:

- Library Science 2a-2b or 12 (Reference), 7 (History of Libraries), 9 (Bookmaking), 13a-13b (Public Documents).

School of Music:

- The total credit allowed for courses in music may not exceed 16 hours. At least one-half the credit must be taken in courses in the history and theory of music (1-14 inclusive). Credit may be allowed in practical music for courses preceded by Music 3 and 4 and exclusive of courses open to freshmen to an amount not to exceed one-half of the total allowed any student. No credit will be allowed for courses in public school music.

Physical Training:

- Not to exceed 5 semester hours for men and 7 semester hours for women.

Military Science and Tactics: Military Science 1 and 2.

- Courses not included under paragraph 3 above may not be counted for the degree of A.B. except by special permission of the Dean of the College.

- F. *Bachelors' Theses:* A bachelors' thesis is not generally required in this College. Students of high standing are, however, encouraged to write theses in connection with their major studies. Credit toward the degree is given for thesis work only as part of the work in some course for which the student is registered. The presentation of a thesis is specifically required of all candidates for the honor degree.

III. DIRECTIONS FOR STUDENTS IN JOURNALISM

Students who are preparing to enter the *advertising* or *managerial* sides of journalistic work should enroll in the College of Commerce and Business Administration. See the directions for registration in that College, page 34.

Students who are preparing for journalistic work on the *reportorial*, *literary*, or *editorial* sides should take their major work in English. They should make up their study schedules from the following suggested curriculum*. With the consent of the adviser, other courses may, for purposes of specialization, be substituted for suggested courses. A program which satisfies the group and major requirements may, for instance, be so modified in the third and fourth years as to lay emphasis on any one of the social sciences.

Students in journalism with major in English are subject to the requirements of the General Curriculum in Liberal Arts and Sciences and should follow the directions for students in the General Curriculum, using the outline below in connection with those directions. The directions for freshmen in the General Curriculum are given on pages 17, 18; those for students other than freshmen on pages 19, 20.

The adviser for students in Journalism (with major in English) will be found in Room 323a, University Hall.

Suggested Curriculum in Journalism

(Major in English)

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
<i>Prescribed Subjects</i>	Hours ¹	<i>Prescribed Subjects</i>	Hours ¹
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
	—	Mil. 2b—Military Drill.....	1
Total	5	Total	5

Suggested Electives

Eng. 10—Introduction to Literature—or science	3 or 5
Foreign language	4
Hist. 1a—Continental European History..	4
Lib. 12—General Reference.....	2

Suggested Electives

Eng. 11—Introduction to Literature—or science	3
Foreign language	4
Hist. 1b—Continental European History..	4

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Mil. 2c—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
	—	Mil. 2d—Military Drill.....	1
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Eng. 1—Survey of English Literature—or science	3	Eng. 1—Survey of English Literature—or	
Eng. 12—American Literature.....	2	Pol. Sc. 3—State and Local Government	
Foreign language continued.....	4	or Econ. 3—Money and Banking.....	3
Hist. 3a—History of United States.....	3	Eng. 23—Shakespeare, or English 13,	
Pol. Sci. 1—American National Govern- ment or Econ. 1—Principles of Economics.	5	American Literature	3 or 2
Rhet. 12—News Writing.....	3	Foreign language continued.....	4
	—	Hist. 3b—History of United States.....	3
	—	Rhet. 13—The Newspaper.....	3

*For new additional courses in Journalism see the Description of Courses beginning on page 85, under English (Rhetoric).

¹Semester hours. For definition, see page 85.

THIRD AND FOURTH YEARS

Study lists for these years should be selected from the following list with regard to proper sequence:

	Hours ¹		Hours ¹
Econ. 5, or 10, or 12a—Public Finance, or Corporation Management, or Labor Problems	3	Econ. 11, or 13, or 21—Industrial Consolidation, or Econ. Hist. of Europe, or Socialism and Social Reform.....	3 or 2
English 27 and 21, or 33 or 45—History of Journalism; The Bible; or Literature from 1789 to 1837; or Modern Drama	2 or 3	English 28 and 24 or 3 or 5—Hist. of Journalism, Victorian Period, Milton, Shakespeare	2 or 3
History 21—U. S. since 1877, 26—The Latin American Colonies.....	3	History 17, 27, 29—Hist. of Illinois, Latin America, The Far East.....	3 or 2
Language	4	Language	4
Philosophy 1—Logic, and Phil. 9—Political Ethics, or Pol. Sci. 5—Constitutional Law	3 or 2 or 4	Philosophy 2—Introduction to Philosophy. 3	
Pol. Sci. 14—Political Parties—or Pol. Sci. 4—Municipal Government.....	3	Pol. Sci. 18, or 28—Contemporary Politics	3 or 2
Psychology 1—Intro. to Psychology....	3	Psychology 1—Intro. to Psychology....	3
Rhet. 6, 15, 26, 28—Short Story, Editorials and Special Articles, Editorial Practice, Newspaper Problems	3	Rhet. 16, 17, 27, 29—Editorials and Special Articles, Advanced Composition, Editorial Practice, Making a Country Newspaper	2 or 3
Soc. 1—Principles of Sociology.....	3	Sociology 9—Criminology	3

IV. DIRECTIONS FOR STUDENTS IN THE CURRICULUM PRELIMINARY TO LAW

It is recognized by the best authorities on legal education that professional studies in law should be preceded by a thoro course in the humanities and the sciences. As a foundation for the study and practise of law, the following subjects offered by this College are of special importance: English, with special reference to composition and public speaking; Latin and French; logic; constitutional and political history; political science; economics; sociology.

By the proper selection of his studies it is possible for a prospective law student to take both the degree in arts and the degree in law in six years. A student who has senior standing in the College of Liberal Arts and Sciences and who has earned at least 30 hours in this college may take and count the first full year of law work for thirty hours of credit toward the A.B. degree, or, if he takes and successfully carries less than the full amount it shall be counted only hour for hour toward the A.B. degree. *Students are not permitted to take this work in law until their senior year.* If the student is also a candidate for the degree of LL.B., or J.D., he should in his fourth year register in the College of Law, pay the usual fee of that College, and file a copy of his study-list with the adviser for seniors in this College. A fee of five dollars is charged for every law subject taken by students who do not pay the regular law school fee.

The degree of Bachelor of Arts is conferred at the close of the fourth year of the combined course provided that all the requirements for the degree are met at that time.

Students admitted to this University from other institutions may count the above courses in law for the degree of A.B. only on condition of completing at least 30 hours' work in residence in subjects offered by the College of Liberal Arts and Sciences.

¹Semester hours. For definition, see page 85.

V. DIRECTIONS FOR STUDENTS IN HOUSEHOLD SCIENCE

The courses of instruction given in this department are planned to meet the needs of four classes of students: (a) those who desire a knowledge of the general principles and facts of household science; (b) those who wish to make a specialty of household science for the purpose of teaching the subject in secondary schools and colleges; (c) those who wish a knowledge of the principles underlying household administration and institutional management; (d) those who are interested in work in dietetics.

The suggested courses for teachers and for institutional workers are outlined below. The first three years of the course as outlined for teachers give a scientific basis for the work of the dietitian.

Students who hold *scholarships in household science* must make this subject their major along one of the lines indicated above and take each semester at least four hours in household science or in subjects required for admission to courses in household science.

Students who major in household science must also satisfy the requirements of the General Curriculum in the College of Liberal Arts and Sciences in so far as these are not covered in the courses given below, and should follow the directions for students in the General Curriculum, using the outlines below in connection with those directions. The directions for freshmen in the General Curriculum are given on pages 17, 18, those for students other than freshmen on pages 19, 20.

The adviser for students in Household Science will be found in Room 315, University Hall, on the registration days.

Suggested Curriculum for Teachers of Household Science

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1—Inorganic Chemistry or.....	5	Chem 2a—Inorg. Chem. and Qual. Anal..	5
² Chem. 1a—Inorganic Chemistry.....	3	Foreign language	4
Foreign language	4	³ H. Sci. 1—Principles of the Selection and	
H. Sci. 2—Home Arch. and Sanitation... 2		Preparation of Food.....	3
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 7—Physical Training.....	1	Phys. Tr. 7—Physical Training.....	1
Phys. Tr. 9—Hygiene.....	1		
Total	14 or 16	Total	16

SECOND YEAR	
A. & D. 1.—Free Hand Drawing.....	3
Chem. 13a—Agricultural Analysis.....	5
Eng. 1—Survey of English Literature....	4
H. Sci. 6—Economic Uses of Food.....	3
Lib. Sci. 12—General Reference.....	2
Total	17

A. & D. 12—Applied Design.....	2
Bot. 1—General Botany or	
Zool. 1—General Zoology.....	5
Chem. 9—Organic Chemistry.....	3
Chem. 9c—Organic Synthesis.....	2
Eng. 2—Survey of English Literature....	4
H. Sci. 7—Textiles.....	2
Total	18

¹Semester hours. For definition, see page 85.

²If Chemistry 1a is taken, a 2-hour elective must be added, with the approval of the adviser.

³Attention is called to the fact that high school physics is a prerequisite for Household Science 1.

⁴Choice depends upon whether the student wishes to emphasize the sciences or economics as a minor.

THIRD YEAR

Hist. 1a—Continental European Hist. or Hist 3a—History of the U. S.....4 or 3	Bact. 5—Bacteriology 5
H. Sci. 19—Dress Design..... 3	Hist. 1b—Continental European Hist. or Hist. 3b—History of U. S.....4 or 3
Physiol. 4—General Physiology..... 5	H. Sci. 3—Home Decoration..... 2
	H. Sci. 5—Dietetics 3
	H. Sci. 12—Clothing 3
Total11	Total16

Electives

Philos. 1—Logic 3
Psychol. 1—Introduction to Psychology... 3

Electives

Econ. 2—Principles of Economics..... 3
H. Sci. 14—Problems in the Preparation and Service of Food..... 3
Philos. 2—Introduction to Philosophy..... 3
Psychol. 2—General Psychology..... 3

FOURTH YEAR

Edu. 1—Introduction to Education..... 4	Educ. 10—Technique of Teaching..... 3
H. Sci. 4—Food and Nutrition..... 5	H. Sci. 11—Teachers' Course..... 3
H. Sci. 13—Hist of Home Economics..... 2	
Total11	Total 6

Electives

Edu. 16—Social Education..... 3
English, Advanced
H. Sci. 18—Lunch Room Management... 5
Public Speaking 1—Oral Expression..... 2
Sociol. 1—Principles of Sociology..... 3

Electives

English, Advanced
H. Sci. 10—Home Management..... 2
H. Sci. 17—Problems in Textiles..... 3
Public Speaking 2—Oral Expression..... 2
Sociol. 7—Social Problems of the Rural Community 2

Suggested Curriculum in Household Administration

FIRST YEAR

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1—Inorganic Chemistry or..... 5		Chem. 2a—Inorg. Chem. and Qual. Anal.. 5	
² Chem. 1a—Inorganic Chemistry..... 3		Foreign language..... 4	
Foreign language 4		³ H. Sci. 1—Principles of the Selection and Preparation of Food..... 3	
H. Sci. 2—Home Arch. and Sanitation... 2		Rhet. 2—Rhetoric and Themes..... 3	
Rhet. 1—Rhetoric and Themes..... 3		Phys. Tr. 7b—Physical Training..... 1	
Phys. Tr. 7a—Physical Training..... 1			
Phys. Tr. 9—Hygiene 1			
Total14 or 16		Total16	

SECOND YEAR

A. & D. 1—Free Hand Drawing..... 3	A. & D. 12—Applied Design..... 2
Foreign language or English 1..... 4	Bot. 1—General Botany or
H. Sci. 6—Economic Uses of Food..... 3	Zool. 1—General Zoology..... 5
H. Sci. 7—Textiles..... 2	Foreign language or English 2..... 4
Total12	Total11

Electives

A. & D. 19—History of the Fine Arts... 2
⁴ Chem. 13a—Agricultural Analysis or
⁴ Econ. 26—Economic Resources.....5 or 3
Hist. 1a—Continental European Hist. or Hist. 3a—History of the U. S.....3 or 4
Lib. Sci. 12—General Reference..... 2

Electives

A. & D. 19—History of the Fine Arts... 2
⁴ Chem. 9—Organic Chemistry and..... 3
Chem. 9c—Organic Synthesis or
⁴ Econ. 22—Econ. Hist. of U. S...2 or 3
Hist. 1b—Continental European Hist. or Hist. 3b—History of the U. S.....3 or 4

¹Semester hours. For definition, see page 85.²If Chemistry 1a is taken, a 2-hour elective must be added, with the approval of the adviser.³Attention is called to the fact that high school physics is a prerequisite for Household Science 1.⁴Choice depends upon whether the student wishes to emphasize the sciences or economics as a minor.

THIRD YEAR

Econ. 1—Principles of Economics..... 5	H. Sci. 3—Home Decoration..... 2
H. Sci. 19—Dress Design..... 3	H. Sci. 5—Dietetics 3
Physiol. 4—General Physiology..... 5	H. Sci. 12—Clothing 3
Total 13	Total 8

Electives

English	
H. Sci. 14—Problems in the Preparation and Service of Food..... 3	
Psychol. 1—Introduction to Psychology.. 3	
Sociol. 1—Principles of Sociology..... 3	
Bact. 5—Introduction to Bacteriology.... 5	

Electives

H. Sci. 10—Home Management..... 2	
Philos. 2—Introduction to Philosophy.... 3	
Pol. Sci. 3—State and Local Government.. 3	
Pol. Sci. 16—Government of Illinois..... 2	
Psychol. 2—General Psychology or	
Edu. 1—Intro. to Education..... 3 or 4	

FOURTH YEAR

Suggested Electives

Edu. 1—Introduction to Education..... 4	
English, Advanced	
H. Sci. 4—Food and Nutrition..... 5	
H. Sci. 13—History of Home Economics.. 2	
H. Sci. 15—Economics of the Family Group 3	
H. Sci. 18—Lunch Room Management.... 5	

Suggested Electives

Edu. 10—Observation and Technic..... 3	
English, Advanced	
H. Sci. 9—Individual Problems..... 3	
H. Sci. 11—Teachers' Course..... 3	
H. Sci. 17—Problems in the Study of Textiles 3	

VI. DIRECTIONS FOR STUDENTS IN SCIENCE CURRICULUMS

(Medicine; Chemistry, Chemical Engineering)

1. Look over the General Directions contained in paragraphs 1-29, pages 9-15.
2. Freshmen who have already secured permits to register, and all other students who were in attendance the second semester of 1915-16 and are in good standing will obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Freshmen without permits, see paragraph 1, page 9. Other students not in attendance last semester or not in good standing, see paragraphs 4 and 5, page 10.
3. Report for registration to the third floor of University Hall, south end. You will find your adviser in one of the following rooms, according to the curriculum in which you are enrolling:
CURRICULUM PREPARATORY TO MEDICINE—Room 310.
CURRICULUM IN CHEMISTRY AND CHEMICAL ENGINEERING—Room 311.
4. Follow, *point by point*, the directions on the first coupon of your study-list.
5. The outlines of the several curriculums follow.

SIX-YEAR AND SEVEN-YEAR MEDICAL CURRICULUMS

The requirement for admission to the four-year medical curriculum (whether the first year of the curriculum is taken at Urbana or in the College of Medicine in Chicago) is as follows: 60 semester hours of college work, including 8 in chemistry, 8 in physics, 8 in biology, 6 in French or German, and 30 elective.

The University offers a six-year and a seven-year combined arts-medicine curriculum. The six-year curriculum includes three years given at Urbana and three years in the College of Medicine in Chicago. The third of the three years given at Urbana is technically described as a one-year medical college curriculum.

The seven-year curriculum includes four years of work at Urbana and three years in the College of Medicine in Chicago. One of the four years at Urbana is devoted to the work of the one-year medical college curriculum. The work given at Urbana includes substantially in both curriculums the work of the first year of a standard curriculum in medicine, together with two years or three years in liberal arts and sciences. Students who have completed the work of the first two years and are taking the work of the third year are registered in both the one-year medical college and the College of Liberal Arts and Sciences.

A student who has completed the curriculum outlined below, covering two years of premedical work and the one-year medical college curriculum at Urbana, may receive credit by transfer for one year of work in the College of Medicine of the University of Illinois or other standard colleges of medicine, and upon the completion of the second year's work in such a college of medicine may receive the degree of Bachelor of Science on the recommendation of the faculty of the College of Liberal Arts and Sciences in the University of Illinois. Under this plan the student may receive the degrees of Bachelor of Science and Doctor of Medicine with six years of work.

Students who wish to take the fourth year in the College of Liberal Arts and Sciences, including the one-year medical college curriculum, are not held to the group requirements prescribed for students taking the regular degree of Bachelor of Arts. The curriculum must be made up with the approval of the adviser for seniors and of the dean of the college. It is recommended that selection be made from the following courses: Bacteriology; Chemistry 5b, 5c, 9a, 9b, 14a-14b, 21, 22, 31, 105, and 106; Entomology 2, 3; Physiology 5; Zoology 4, 5, 8a-8b, 21a-21b, 22, 23, 25-26; modern languages; and studies included in Group 5 of the general curriculum in science (see page 131 of the *University Register* for 1915-16). On the completion of this fourth year, the student takes the degree of Bachelor of Arts before going to the College of Medicine.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1—General Chemistry.....	5	Chem. 2a—Inorganic Chemistry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Zool. 2—Vertebrate Zoology.....	5
Zool. 1—General Zoology.....	5	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military.....	1	Mil. 2b—Military Drill.....	1
	—		—
Total	17	Total	16

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 9, 9c—Organic Chemistry.....	5
German 1 or 4 ² , or Latin.....	4	German 3 or 5 or 6 ² , or Latin.....	4
Physics 7a—General Physics.....	2½	Physics 7b—General Physics.....	2½
Physics 8a—Laboratory.....	2½	Physics 8b—Laboratory.....	2½
Zool. 3—Microscopic Techniques.....	3	Zool. 6—Vertebrate Organogeny.....	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
	—		—
Total	18	Total	18

THIRD YEAR

(One-Year Medical College Curriculum)

FIRST SEMESTER		SECOND SEMESTER	
	Hours		Hours
Bacteriology 5—Introduction.....	3	Bact. 2b—Pathological Bacteriology.....	3
Chem. 15—Physiological Chemistry.....	5	Chem. 15a—Metabolism.....	2
Physiol. 1—Histology.....	3	Physiol. 2—Experimental Physiology.....	5
Physiol. 4—General Physiology.....	5	Physiol. 8—Histology.....	5
Human Anatomy 1—Introduction.....	3	Human Anatomy 2—Introduction.....	3
Total	19	Total	18

Curriculum in Chemistry

Students who follow the General Curriculum in the College of Liberal Arts and Sciences with chemistry as a major subject are eligible for the degree of Bachelor of Arts. They should follow the directions given for freshmen on pages 17, 18, for students other than freshmen on pages 19, 20.

For the more specialized training of the chemist the following curriculum, largely prescribed, has been arranged. It requires a maximum total of 136 hours, and leads to the degree of Bachelor of Science in chemistry.

Preliminary preparation in German or French equivalent to two years of high school work or one year of university work is prescribed. The total language requirement for graduation in the curriculum in chemistry, including courses offered for entrance, must be equivalent to two years of university German and one year of university French.

Students having one year of high school chemistry should register in Chemistry 1a. Students not having such preliminary work in high school should register in Chemistry 1 (5 hours) and arrange the other subjects in consultation with their adviser.

In the following schedule of courses, after the second year, there are offered certain *prescribed subjects* required of all students and in addition five *group options*, the last four of which are outlined for the purpose of affording systematic training along certain important lines of applied chemistry. The first option, A, is intended for those students who wish to place chief emphasis upon the fundamental branches of chemistry as a science and for those students who desire a combination of subjects not outlined in the other four groups. Students in option A must submit to their adviser at the beginning of the junior year an outline of their proposed course of study for the junior and senior years. Approval of such an outline must be secured from the adviser before registering. At least 12 hours of the electives under option A must be in chemistry and it is recommended that they be selected as far as possible from more advanced courses in inorganic, analytic, organic, and physical chemistry. In all groups, except B, 10 hours of the electives must be taken outside of the department and must include a course in economics.

The groups provided for, with the letter used to designate each group, are as follows:

- A. General
- B. Electrochemical
- C. Industrial
- D. Food and Sanitation
- E. Physiological

¹Semester hours. For definition, see page 85.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1 or 1a—Inorganic Chemistry.....	5 or 3	Chem. 3a—Inorganic Chemistry and Qualitative Analysis.....	6
German or French.....	4	German or French.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Plane Trigonometry.....	2	P. T. 2—Gymnasium.....	1
Rhet. 1—Rhetoric and Themes.....	3	Mil. 2b—Military Drill.....	1
P. T. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1		
Total	17	Total	18

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 5b—Advanced Analytical Chemistry. 5	
French or German.....	4	French or German.....	4
Rhet. 2—Rhetoric and Themes.....	3	History 2 or 3 or English 20.....	3
Phys. 1a and 3a—General Physics and Physical Measurements	5	Phys. 1b and 3b—General Physics and Physical Measurements.....	4
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Total	18	Total	17

THIRD YEAR

Prescribed for all Groups

Chem. 14a—Organic Chemistry.....	4
Chem. 9a—Organic Synthesis and Ultimate Analysis	2
Chem. 92a—Journal Meeting.....	1
Math. 8a—Differential and Integral Calculus	5
Total	12

Group Options

A.—General	
Electives	5
B.—Electrochemical	
Economics 1; or Economics 2 with 3 additional hours other than Chemistry	5
C.—Industrial	
Chem. 65—Technical Gas and Fuel Analysis	2
Elective	2—4
D.—and E.—Food and Physiological Bact. 5—Introductory Bacteriology	5

*Students electing Option B must register in Math. 7.

Prescribed for all Groups

Chem. 14b—Principles of Organic Chemistry	2
Chem. 9b—Organic Synthesis and Qualitative Analysis	2
Chem. 31—Principles of Physical Chemistry	4
Chem. 33—Physical Chemistry Laboratory. 2	
Chem. 92b—Journal Meeting.....	1
Chem. 90—Inspection Trip.....	
Total	11

Group Options

A.—General	
Electives	5
B.—Electrochemical	
Matn. 9	3
E. E. 8—Electric Currents and Apparatus	3
E. E. 68—Electrical Engineering Laboratory	1—7
C.—Industrial	
E. E. 8—Electric Currents and Apparatus	3
E. E. 68—Electrical Engineering Laboratory	1
Elective	2—6

Electives in Chemistry

D.—and E.—Food and Physiological Chem. 15—Physiological Chemistry	5
Elective	2—7

¹Semester hours. For definition, see page 85.

FOURTH YEAR

Prescribed for all Groups

Chem. 95—History of Chemistry.....	2
Chem. 11a—Research	3
Chem. 93a—Journal Meeting.....	1

Total 6

Group Options

A.—General	
Electives	11
B.—Electrochemical	
Chem. 35—Electrochemistry	3
Chem. 37—Experimental Problems in Physical and Electrochem- istry	4
Phys. 4a.—Electrical and Mag- netic Measurements	2
Electives	2—11
C.—Industrial	
Chem. 35—Electrochemistry	3
Chem. 7—Metallurgy	3
Chem. 69—Metallurgical Labora- tory and Assaying.....	2
Electives	3—11
D.—Food and Sanitation	
Chem. 5c—Food Analysis.....	5
Chem. 21—Qualitative Organic Analysis	2
Electives	3—10
E.—Physiological	
Chem. 15a	5
Electives	5—10

Prescribed for all Groups

Chem. 6—Chemical Technology.....	3
Chem. 11b—Research	7
Chem. 93b—Journal Meeting.....	1
Chem. 91—Inspection Trip.....	

Total 11

Group Options

A.—General	
Electives	5
B.—Electrochemical	
Philos. 1—Logic.....	3
Electives	2—5
C.—Industrial	
Chem. 61—Industrial Laboratory.	3
Electives	3—6
D. and E.—Food and Physiological	
Electives	5

Curriculum in Chemical Engineering

The work of the technical chemist or superintendent is frequently so closely associated with mechanical and other engineering lines as to make a knowledge of these subjects essential. To meet these conditions, the following four-year curriculum in chemistry and related engineering subjects has been arranged. The degree given is that of Bachelor of Science in chemical engineering.

Preliminary preparation in German equivalent to two years of high school or one year of university work is *prescribed*. It is also advised that students intending to take this curriculum be prepared to offer mechanical drawing for entrance or arrange to take General Engineering Drawing 1 or S1.

Students having one year of high school chemistry should register in Chemistry 1a. Students not having such preliminary work in high school should register in Chemistry 1 (5 hours) and arrange the other subjects in consultation with their adviser.

FIRST YEAR

FIRST SEMESTER

	Hours ¹
Chem. 1a or 1—Inorganic Chemistry..	3 or 5
German 4—Prose Reading.....	4
Math. 2—College Algebra.....	3
Math. 4—Plane Trigonometry.....	2
P. T. 1—Gymnasium.....	1
Mil. 2a—Military Drill.....	1
Total	14 or 16

SECOND SEMESTER

	Hours ¹
Chem. 3a.—Inorganic Chemistry and Quali- tative Analysis	6
German 6—Scientific German	4
Math. 6—Analytical Geometry.....	5
P. T. 2—Gymnasium.....	1
Mil. 2b—Military Drill.....	1
Mil. 1—Drill Regulations.....	1
Total	18

¹Semester hours. For definition, see page 85.

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 5b—Advanced Analytical Chemistry 5	
Math. 8—Differential and Integral Calculus	5	Phys. 1b—General Physics.....	2
Phys. 1a—General Physics.....	3	Phys. 2b—Physical Measurements.....	2
Phys. 3a—Physical Measurements.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	T. and A. M. 20—Analytical Mechanics...	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Total	19	Total	16

THIRD YEAR

Chem. 9a—Organic Synthesis and Ultimate Analysis	2	Chem. 9b—Organic Synthesis and Qualitative Organic Analysis.....	2
Chem. 14a—Organic Chemistry	4	Chem. 14b—Organic Chemistry.....	2
Chem. 92a—Journal Meeting	1	Chem. 31—Physical Chemistry.....	4
M. E. 75—Forge Work.....	1	Chem. 32—Physical Chemistry Laboratory	2
M. E. 77—Foundry Work.....	2	Chem. 92b—Journal Meeting.....	1
T. and A. M. 21—Analytical Mechanics..	2	Electives outside of the department.....	3
T. and A. M. 25—Resistance of Materials 4		E. E. 8—Electrical Currents and Apparatus	3
		E. E. 68—Electrical Engineering Laboratory	1
		Inspection trip	
Total	16	Total	18

FOURTH YEAR

Chem. 7—General Metallurgy and Iron and Steel	3	Chem. 6—Chemical Technology	3
Chem. 11a—Research	3	Chem. 11b—Research	6
Chem. 35—Electrochemistry	3	Chem. 61—Industrial Chemical Laboratory	3
Chem. 65—Technical Gas and Fuel Analysis	2	Chem. 93b—Journal Meeting	1
Chem. 69—Assaying	2	M. E. 64—Mechanical Engineering Laboratory	3
Chem. 93a—Journal Meeting.....	1	Inspection trip	
M. E. 1—Steam and Air Machinery.....	3		
Total	17	Total	16

VII. CLASS ADVISERS

Approval of the course of study selected must be secured from the class adviser in the room and building indicated below:

1. Students in general liberal arts and sciences:
 - (a) Freshmen and sophomores...Rooms 206, 207, 208, University Hall
 - (b) Juniors
 - (c) Seniors (including all students who plan to graduate next June).....Room 308, University Hall
 - (d) Specials
2. *Household Science*
3. *Medicine*
4. *Chemistry and Chemical Engineering*.....

Advisers whom students are to consult during the year for advice and assistance will be announced upon the bulletin boards or by mail shortly after registration.

VIII. HEADQUARTERS OF DEPARTMENTS

The headquarters of the different departments, where the heads or their representatives may be consulted during the registration period, are as follows:

U. H.= University Hall; N. H.= Natural History Hall; L. H.= Lincoln Hall; Com.= Commerce Building; P. L.= Physical Laboratory; Chem.= Chemistry Building.

Art and Design.....	Room 405	U. H.
Astronomy	Room 421	N. H.
Bacteriology	Room 314	U. H.
Botany	Room 209	N. H.
Chemistry	Room 102	Chem.
Comparative Literature	Room 210	U. H.
Comparative Philology	Room 210	U. H.
Economics	Room 103	Com.
Education	Room 203	U. H.
English	Room 323	U. H.
Entomology	Room 223	N. H.
French	Room 309	U. H.
Geology	Room 232	N. H.
German	Room 210	U. H.
Greek	Room 126	L. H.
History	Room 414	U. H.
Household Science	Room 315	U. H.
Italian	Room 309	U. H.
Journalism (English)	Room 323	U. H.
Latin	Room 126	L. H.
Mathematics, <i>freshmen</i>	Room 437	N. H.
Mathematics, <i>sophomores</i>	Room 430	N. H.
Philosophy	Room 119	L. H.
Physics	Room 203	P. L.
Physiology	Room 419	N. H.
Political Science	Room 414	U. H.
Portuguese	Room 309	U. H.
Psychology	Room 210	U. H.
Rhetoric	Room 323	U. H.
Scandinavian	Room 209	L. H.
Sociology	Room 318	L. H.
Spanish	Room 309	U. H.
Zoology	Room 301	N. H.

THE COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION

DIRECTIONS FOR REGISTRATION

1. Business students should read the headings of the paragraphs numbered 1-29 of the General Directions for Registration on pages 9-15 and follow those which apply to them.

2. *Freshmen* who have received a permit to register will obtain their study-lists at the table in the lobby on the first floor of the Commerce Building.

3. *Former business students* who were in attendance the second semester of 1915-16 and are in good standing will obtain their study-lists at the table in the lobby on the first floor of the Commerce Building.

4. Freshmen who have not received a permit to register should report at the Registrar's Office, 156 Administration Building.

5. Students not in attendance last semester, not in good standing, transferring from other colleges within the University, etc., should follow the general directions referred to in paragraph 1 above.

6. Having secured his study-list the student should follow, *point by point*, the directions on the first coupon. The *Registration Officers* for Business Students will be found in the following places:

Freshmen in Room 303, Commerce Building

Sophomores in Room 202, Commerce Building

Juniors in north end of Room 208, Commerce Building

Seniors in south end of Room 208, Commerce Building

Specials in Room 103, Commerce Building

7. Each student must secure the approval of his Registration Officer for the studies he has chosen. *This approval must be stamped on the study-list.* Each student must then report to the Chapel, 218 University Hall, for the purpose of securing approval of sections in sectional courses, making out class cards, and paying fees.

REQUIREMENTS FOR GRADUATION

I. THE NEW REQUIREMENTS—DEGREE OF BACHELOR OF SCIENCE

Students who entered the College of Commerce and Business Administration with the class of 1919 and subsequent classes will be given the degree of Bachelor of Science.

The requirements for the degree are as follows:

1. A candidate must comply with the University requirements as to residence and registration, and secure credit amounting to 130 hours, including the general University requirements of *Rhetoric 1-2, 6 hours; and Physical Training 1, 1a and 2, 2 hours, for men, and 7a-7b and 9, 3 hours, for women; and Military Science 1, 2a-2b and 2c-2d, 5 hours, for men.*
2. A candidate must secure credit in the subjects listed as *prescribed* in his chosen curriculum.

3. Of the electives allowed, 8 hours must be either in English literature or in foreign language in all curriculums, but prescribed courses in either of these subjects may be counted in meeting this requirement.
4. In the General Business Curriculum, the Curriculum in Banking, the Curriculum in Insurance, the Curriculum in Accountancy, the General Curriculum in Railway Administration, the Curriculum in Commerce and Law, and the Curriculum for Commercial and Civic Secretaries, 12 hours must be elected from the following group of subjects: History, political science, philosophy, psychology, and sociology, provided that not less than six hours in any one subject may be counted in fulfilling this requirement; but prescribed courses in any of these subjects may be counted in meeting the requirement.
5. Ten hours must be elected from the following group of subjects: Chemistry, mathematics, and physics, provided that not less than 5 hours in any one subject may be counted in fulfilling this requirement; but prescribed courses in any of these subjects may be counted in meeting the requirement.
6. Free electives sufficient to make up the 130 hours required for graduation may be selected from any department of the University. Such electives must, however, be chosen with a view to promoting the specific object of the curriculum pursued and must have the approval of the Dean of the College.

II. THE OLD REQUIREMENTS—DEGREE OF BACHELOR OF ARTS

The graduation requirements for former students in the Curriculum in Business Administration will remain as they have been in the past and such students will be given the degree of Bachelor of Arts.

The requirements are as follows:

1. Credit amounting to 130 hours, including the prescribed Rhetoric, Physical Training, and Military.
2. At least 8 hours in each of the following groups of subjects:
 - I. English language and literature, including rhetoric.
 - II. Latin, Greek, French, German, Italian, Spanish.
 - III. History, economics, sociology, and political science.
 - IV. Mathematics, education, philosophy, and psychology.
 - V. Astronomy, botany, chemistry, entomology, geology, physiology, physics, and zoology.
3. Credit in the following subjects:
 - I. Six hours of freshman economics (Economics 7, 22, 26, and 27). In case of students transferring from other colleges with advanced standing this requirement may be modified to suit the individual needs.
 - II. Principles of Economics (Economics 1).
 - III. Business Writing (Rhetoric 10), Senior Conference on Written Work (Rhetoric 25-26).
 - IV. Principles of Accounting (Accountancy 1a-1b).
 - V. Commercial Law (Business Law 1a-1b).
4. A major of 24 hours in economics, but not more than six hours of freshman economics (Economics 7, 22, 26, and 27) may be counted towards the major. Courses in accountancy and business law may not be counted towards the major.

NOTE.—The outlines of the curriculums on the following pages must be used in connection with the foregoing statement of requirements and attention given to the additional subjects prescribed in the third and fourth years under the old requirements for graduation.

THE CURRICULUMS

The curriculums in commerce and business administration are now in process of transition as a result of the reorganization of the former *Courses in Business Administration* as the *College of Commerce and Business Administration*. The outlines which follow show the complete curriculums under the new requirements for graduation and the third and fourth years under the old requirements for graduation.

The subjects listed in each curriculum under the new requirements are prescribed for graduation. Sufficient electives must be taken each semester to make up a minimum of 15 hours, but not to exceed a maximum of 18 hours of work. In choosing electives the attention of students is called to provisions 3, 4, and 5 of the new requirements for graduation. It is advisable that the electives there mentioned be taken as far as possible in the first two years in order to leave more opportunity for free electives in the last two years.

General Business Curriculum

Under the New Requirements for Graduation

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 1a—Principles of Accounting.....	3	Acc'y. 1b—Principles of Accounting.....	3
Econ. 26—Economic Resources.....	3	Econ. 22—Economic History of the United States	3
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 1—Gymnasium.....	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
Electives	4-7	Mil. 2b—Military Drill.....	1
		Electives	3-6
Total	15-18	Total	15-18

SECOND YEAR

Acc'y 2a—Advanced Accounting and Auditing	3	Acc'y 2b—Advanced Accounting and Auditing	3
Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Rhet. 10—Business Writing.....	2	Mil. 2d—Military Drill.....	1
Mil. 2c—Military Drill.....	1	Electives	8-11
Electives	4-7		
Total	15-18	Total	15-18

THIRD YEAR

Bus. Org. & Op. 1—Business Organization and Operation	3	Bus. Law 1b—Commercial Law.....	3
Bus. Law 1a—Commercial Law.....	3	Bus. Org. & Op. 2—Organization and Control of Mercantile Distribution.....	3
Econ. 28—Domestic Commerce.....	3	Econ. 10—Corporation Management and Finance	3
Trans. 1—Transportation System of the United States	3	Rhet. 22—Summarizing and Briefing.....	2
Electives	3-6	Trans. 12—Freight Shipment.....	2
		Electives	2-5
Total	15-18	Total	15-18

¹Semester hours. For definition, see page 85.

FOURTH YEAR

Hours ¹		Hours ¹	
Bus. Org. & Op. 7—Salesmanship.....	3	Bus. Org. & Op. 8—Advertising.....	3
Econ. 5—Public Finance.....	3	Econ. 31—Organization of Foreign Commerce.....	3
Rhet. 25—Conference on Written Work..	1	Rhet. 26—Conference on Written Work..	1
Electives	8-11	Electives	8-11
Total	15-18	Total	15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Acc'y 1a—Principles of Accounting.....	3	Acc'y 1b—Principles of Accounting.....	3
Bus. Org. & Op. 1—Business Organization and Operation	3	Econ. 10—Corporation Management.....	3
Econ. 28—Domestic Commerce.....	3	Econ. 31—Organization of Foreign Commerce	3
Total	9	Trans. 12—Freight Shipment.....	2
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Econ. 5—Public Finance.....	3	Econ. 11—Industrial Consolidations.....	3
History		History	
Psych. 1—Psychology	3	Psych. 2—Psychology	3
Rhet. 22—Summarizing and Abstracting..	2	Trans. 2—Transportation Policy.....	3
Trans. 1—Transportation System.....	3		

FOURTH YEAR FOR THE CLASS OF 1917

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Org. and Op. 7—Salesmanship.....	3	Bus. Org. and Op. 8—Advertising.....	3
Rhet. 25—Conference on Written Work..	1	Rhet. 26—Conference on Written Work..	1
Total	7	Total	7
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Acc'y 2a—Advanced Accounting and Auditing	3	Acc'y 2b—Advanced Accounting and Auditing	3
Bus. Org. and Op. 7—Salesmanship.....	3	Bus. Org. and Op. 4—Industrial Organization and Management.....	2
Econ. 4—Financial History of U. S.....	3	Bus. Org. and Op. 8—Advertising.....	3
Econ. 12a—Labor Problems.....	3	Bus. Org. and Op. 9—Commercial and Civic Organization	1
Phil. 9—Political Ethics.....	2	Econ. 12b—Labor Problems.....	3
		Econ. 13—Economic Development of Europe	3

Curriculum for Commercial and Civic Secretaries

Under the New Requirements for Graduation

The first and second years of this curriculum are the same as in the General Business Curriculum except that Political Science 1—American Government (3)—is prescribed in the first semester of the second year, while Rhetoric 10—Business Writing (2)—is transferred to the second semester.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Hours ¹		Hours	
Bus. Org. and Op. 1—Business Organization and Operation	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution.....	3
Econ. 28—Domestic Commerce.....	3	Econ. 10—Corporation Management and Finance	3
Pol. Sci. 4—Municipal Government.....	3	Rhet. 22—Summarizing and Briefing.....	2
Sociol. 8—Charities	3	Trans. 12—Freight Shipment.....	2
Electives	3-6	Electives	5-8
Total	15-18	Total	15-18

¹Semester hours. For definition, see page 85.

FOURTH YEAR

Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Econ. 5—Public Finance.....	3	Bus. Org. and Op. 8—Advertising.....	3
Econ. 51—Public Utilities.....	3	Bus. Org. and Op. 9—Commercial and Civic Organizations	1
Rhet. 25—Conference on Written Work..	1	Hort. 10b—Town Improvement.....	2
Electives	5-8	Rhet. 26—Conference on Written Work..	1
		Electives	5-8
Total	15-18	Total	15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Acc'y 1a—Principles of Accounting.....	3
Econ. 28—Domestic Commerce.....	3
Pol. Sci. 13—State Administration.....	3
Pol. Sci. 4—Municipal Government.....	3
Total	12

Suggested Electives

Bus. Org. and Op. 1—Business Organiza- tion and Operation.....	3
Phil. 9—Political Ethics.....	2
Sociology 1—Principles of Sociology.....	3

Prescribed Subjects

Acc'y 1b—Principles of Accounting.....	3
Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	3
Econ. 31—Organization of Foreign Com- merce	3
Econ. 10—Corporation Management.....	3
Sociology 8—Charities	3
Total	15

Suggested Electives

Econ. 11—Industrial Consolidation.....	3
Econ. 34—Property Insurance.....	2
Pol. Sci. 12—National Administration....	3
Pol. Sci. 16—Government of Illinois....	2
Rhet. 22—Summarizing and Abstracting..	2

FOURTH YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Bus. Law 1a—Commercial Law.....	3
Bus. Org. and Op. 7—Salesmanship.....	3
Rhet. 25—Conference on Written Work..	1

Total 7

Suggested Electives

Econ. 12a—Labor Problems.....	3
Econ. 11—Industrial Consolidations.....	3
Sociology 10—Population	3
Trans. 1—Transportation System.....	3

Prescribed Subjects

Bus. Law 1b—Commercial Law.....	3
Bus. Org. and Op. 4—Industrial Organi- zation and Management.....	2
Bus. Org. and Op. 9—Commercial and Civic Organizations	1
Bus. Org. and Op. 8—Advertising.....	3
Rhet. 26—Conference on Written Work..	1
Trans. 12—Freight Shipment.....	2

Total 12

Suggested Electives

Econ. 21—Socialism and Economic Reform	2
Econ. 12b—Labor Problems.....	3
Sociology 9—Criminology	3

Curriculum in Banking

Under the New Requirements for Graduation

The first and second years are the same as in the General Business Curriculum except that Mathematics 2—College Algebra (3)—is prescribed in the first semester of the first year.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER		Hours ¹	
Bus. Org. and Op. 1—Business Organiza- tion and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	3		
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3		
Econ. 5—Public Finance.....	3	Econ. 10—Corporation Management and Finance	3		
Econ. 28—Domestic Commerce.....	3	Math. 23—Mathematics of Investment....	3		
Electives	3-6	Electives	3-6		
Total	15-18	Total	15-18		

¹Semester hours. For definition, see page 85.

FOURTH YEAR

Econ. 9—Practical Banking.....	2	Econ. 8—The Money Market.....	2
Econ. 4—Financial History of the United States	3	Econ. 31—Organization of Foreign Commerce	3
Rhet. 25—Conference on Written Work..	1	Rhet. 26—Conference on Written Work..	1
Electives	9-12	Electives	9-12
Total	15-18	Total	15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Acc'y 1a—Principles of Accounting.....	3
Bus. Org. and Op. 1—Business Organization and Operation.....	3
Econ. 5—Public Finance.....	3
Econ. 28—Domestic Commerce.....	3
Total	12

Suggested Electives

History	
Psych. 1—Introduction to Psychology.....	3
Trans. 1—Transportation System.....	3

Prescribed Subjects

Acc'y 1b—Principles of Accounting.....	3
Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution.....	2
Econ. 10—Corporation Management.....	3
Math. 23—Mathematics of Investment....	3
Total	11

Suggested Electives

Econ. 29—Foreign Commerce.....	3
Econ. 31—Organization of Foreign Commerce	3
History	
Trans. 12—Freight Shipment.....	2

FOURTH YEAR FOR THE CLASS OF 1917

Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Econ. 4—Financial History of United States	3	Econ. 8—The Money Market.....	2
Econ. 9—Practical Banking.....	2	Rhet. 26—Conference on Written Work...	1
Rhet. 25—Conference on Written Work...	1	Total	6
Total	9		

Suggested Electives

Acc'y 2a—Advanced Accounting and Auditing	3
Econ. 12a—Labor Problems.....	3
Econ. 33—Economics of Insurance.....	2
Phil. 9—Political Ethics.....	2

Suggested Electives

Acc'y 2b—Advanced Accounting and Auditing	3
Bus. Org. and Op. 4—Industrial Organization and Management.....	2
Econ. 12b—Labor Problems.....	3
Econ. 34—Property Insurance.....	2

Curriculum in Insurance

Under the New Requirements for Graduation

FIRST YEAR

FIRST SEMESTER

	Hours ¹
Acc'y 1a—Principles of Accounting.....	3
Econ. 26—Economic Resources.....	3
Math. 2—College Algebra.....	3
Math. 4—Trigonometry	2
Rhet. 1—Rhetoric and Themes.....	3
Phys. Tr. 1—Gymnasium.....	1
Mil. 2a—Military Drill.....	1
Electives	0-2
Total	16-18

SECOND SEMESTER

	Hours ¹
Acc'y 1b—Principles of Accounting.....	3
Econ. 22—Economic History of the United States	3
Math. 6—Analytical Geometry.....	5
Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 2—Gymnasium.....	1
Mil. 1—Drill Regulations.....	1
Mil. 2b—Military Drill.....	1
Electives	0-1
Total	17-18

¹Semester hours. For definition, see page 85.

SECOND YEAR

Acc'y 2a—Advanced Accounting and Auditing	3	Acc'y 2b—Advanced Accounting and Auditing	3
Econ. 1—Principles of Economics	5	Econ. 3—Money and Banking	3
Math. 8—Differential and Integral Calculus	5	Rhet. 10—Business Writing	2
Mil. 2c—Drill	1	Mil. 2d—Drill	1
Electives	1-4	Electives	6-9
Total	15-18	Total	15-18

THIRD YEAR

Bus. Law 1a—Commercial Law	3	Bus. Law 1b—Commercial Law	3
Bus. Org. and Op. 1—Business Organization and Operation	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution	3
Econ. 5—Public Finance	3	Econ. 10—Corporation Management and Finance	3
Econ. 28—Domestic Commerce	3	Math. 23—Mathematics of Investment	3
Electives	3-6	Electives	3-6
Total	15-18	Total	15-18

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship	3	Bus. Org. and Op. 8—Advertising	3
Econ. 33—Economics of Insurance	2	Econ. 34—Property Insurance	2
Econ. 9—Practical Banking	2	Math. 31—Actuarial Theory	3
Math. 31—Actuarial Theory	3	Rhet. 26—Conference on Written Work	1
Rhet. 23—Conference on Written Work	1	Electives	6-9
Electives	4-7	Total	15-18
Total	15-18	Total	15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Acc'y 1a—Principles of Accounting	3
Bus. Org. and Op. 1—Business Organization and Operation	3
Math. 31—Actuarial Theory	3
Total	9

Suggested Electives

Econ. 5—Public Finance	3
Foreign Language continued	
Hist. 1a—European History	4
Hist. 3a—History of United States	3

Prescribed Subjects

Acc'y 1b—Principles of Accounting	3
Econ. 10—Corporation Management	3
Total	6

Suggested Electives

Foreign Language continued	
Hist. 3b—History of United States	3
Hist. 1b—European History	4
Phil. 1—Logic	3

FOURTH YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Bus. Law 1a—Commercial Law	3
Econ. 33—Economics of Insurance	2
Rhet. 25—Conference on Written Work	1
Total	6

Suggested Electives

Bus. Org. and Op. 7—Salesmanship	3
Econ. 4—Financial History of United States	3
Econ. 9—Practical Banking	2
Econ. 12a—Labor Problems	3
Phil. 9—Political Ethics	2
Total	13

Suggested Electives

Bus. Law 1b—Commercial Law	3
Econ. 34—Property Insurance	2
Rhet. 26—Conference on Written Work	1
Total	6

Suggested Electives

Bus. Org. and Op. 4—Industrial Organization and Management	2
Bus. Org. and Op. 8—Advertising	3
Econ. 8—Money Market	2
Econ. 12b—Labor Problems	3
Total	10

¹Semester hours. For definition, see page 85.

Curriculum in Accountancy

Under the New Requirements for Graduation

The first and second years are the same as in the General Business Curriculum except that Mathematics 2—College Algebra (3) is prescribed in the first semester of the first year.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 3a—Accounting Problems and Auditing	3	Acc'y 3b—Accounting Problems and Auditing	3
Bus. Law 1a—Commercial Law.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	3
Bus. Org. and Op. 1—Business Organization and Operation.....	3	Bus. Law 1b—Commercial Law.....	3
Econ. 28—Domestic Commerce.....	3	Econ. 10—Corporation Management and Finance	3
Electives	3-6	Math. 23—Mathematics of Investment....	3
		Electives	0-3
Total	15-18	Total	15-18

FOURTH YEAR

Acc'y 5a—C. P. A. Problems.....	2	Acc'y 5b—C. P. A. Problems.....	2
Econ. 9—Practical Banking.....	2	Rhet. 26—Conference on Written Work..	1
Econ. 11—Industrial Consolidations.....	3	Electives	12-15
Rhet. 25—Conference on Written Work... 1			
Electives	5-8		
Total	15-18	Total	15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Acc'y 2a—Advanced Accounting and Auditing	3
Bus. Org. and Op. 1—Business Organization and Operation.....	3
Econ. 5—Public Finance.....	3
Total	9

Suggested Electives

Acc'y 4a—Cost Accounting.....	3
Econ. 28—Domestic Commerce.....	3
Rhet. 22—Summarizing and Abstracting..	2

Prescribed Subjects

Acc'y 2b—Advanced Accounting and Auditing	3
Econ. 10—Corporation Management....	3
Math. 23—Mathematics of Investment....	3
Total	9

Suggested Electives

Acc'y 4b—Cost Accounting.....	3
Econ. 29—Foreign Commerce or	
Econ. 31—Organization of Foreign Commerce	3

FOURTH YEAR FOR THE CLASS OF 1917

Prescribed Subjects

Acc'y 3a—Accounting Problems and Auditing	3
Bus. Law 1a—Commercial Law.....	3
Rhet. 25—Conference on Written Work... 1	
Total	7

Suggested Electives

Econ. 11—Industrial Consolidation.....	3
Econ. 9—Practical Banking.....	2
Econ. 12a—Labor Problems.....	3
Phil. 9—Political Ethics.....	2

Prescribed Subjects

Acc'y 3b—Accounting Problems and Auditing	3
Bus. Law. 1b—Commercial Law.....	3
Rhet. 26—Conference on Written Work..	1
Total	7

Suggested Electives

Bus. Org. and Op 4—Industrial Organization and Management.....	2
Econ. 8—Money Market.....	2
Econ. 12b—Labor Problems.....	3

¹Semester hours. For definition, see page 85.

Commerce and Business Administration

Curriculum in Railway Administration

Under the New Requirements for Graduation

The first year of this curriculum is the same as the first year of the Curriculum in Insurance.

SECOND YEAR

FIRST SEMESTER

	Hours ¹
Acc'y 2a—Advanced Accounting and Auditing	3
Econ. 1—Principles of Economics.....	5
Rhet. 10—Business Writing.....	2
Trans. 7—Railway Organization.....	2
Mil. 2a—Military Drill.....	1
Electives	2-5
Total	15-18

SECOND SEMESTER

	Hours ¹
Acc'y 2b—Advanced Accounting and Auditing	3
Econ. 3—Money and Banking.....	3
Trans. 12—Freight Shipment.....	2
Mil. 2d—Military Drill.....	1
Electives	6-9
Total	15-18

THIRD YEAR

Bus. Org. and Op. 1—Business Organization and Operation.....	3
Bus. Law 1a—Commercial Law.....	3
Trans. 1—Transportation System of the United States	3
Trans. 13—Railway Traffic Administration or	
Trans. 17—Railway Terminal Management	3
Electives	3-6
Total	15-18

Bus. Law 1b—Commercial Law.....	3
Trans. 2—Transportation Policy in Europe and the United States.....	3
Trans. 22—Railway Train Service or	
Trans. 26—Economics of Railway Location and Maintenance.....	3
Electives	6-9
Total	15-18

FOURTH YEAR

Econ. 12a—Labor Problems.....	3
Econ. 28—Domestic Commerce.....	3
Rhet. 25—Conference on Written Work..	1
Trans. 17—Railway Terminal Management or	
Trans. 13—Railway Traffic Administration	3
Electives	5-8
Total	15-18

Econ. 10—Corporation Management and Finance	3
Econ. 12b—Labor Problems.....	3
Rhet. 26—Conference on Written Work..	1
Trans. 26—Economics of Railway Location and Maintenance or	
Trans. 22—Railway Train Service.....	3
Electives	5-8
Total	15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

FIRST SEMESTER

Acc'y 2a—Advanced Accounting and Auditing	3
Trans. 1—Transportation System.....	3
Trans. 17—Railway Terminal Management or	
Trans. 13—Railway Traffic Administration.	3
Electives	6-9
Total	15-18

SECOND SEMESTER

Acc'y 2b—Advanced Accounting and Auditing	3
Econ. 10—Corporation Management.....	3
Math. 23—Mathematics of Investment....	3
Trans. 26—Economics of Railway Location and Maintenance or	
Trans. 22—Railway Train Service.....	3
Trans. 2—Transportation Policy in Europe and United States.....	3
Electives	0-3
Total	15-18

¹Semester hours. For definition, see page 85.

FOURTH YEAR FOR THE CLASS OF 1917

Acc'y 3a—Accounting Problems and Auditing	3
Bus. Law 1a—Commercial Law.....	3
Rhet. 25—Conference on Written Work..	1
Trans. 13—Railway Traffic Administration or	
Trans. 17—Railway Terminal Management	3
Trans. 35a—Thesis	2
Electives	3-6

Total15-18

Acc'y 3b—Accounting Problems and Auditing	3
Bus. Law 1b—Commercial Law.....	3
Rhet. 26—Conference on Written Work... 1	
Trans. 26—Economics of Railway Location and Maintenance or	
Trans. 22—Railway Train Service.....	3
Trans. 35b—Thesis.....	2
Electives	3-6

Total15-18

Curriculum in Railway Transportation

Under the New Requirements for Graduation

FIRST YEAR

FIRST SEMESTER

Hours¹

Acc'y 1a—Principles of Accounting.....	3
G. E. D. 1—Elements of Drafting.....	4
Math. 2—Advanced Algebra.....	3
Math. 4—Trigonometry	2
Rhet. 1—Rhetoric and Themes.....	3
Phys. Tr. 1—Gymnasium.....	1
Mil. 2a—Military Drill.....	1
Electives	0-1

Total17-18

SECOND SEMESTER

Hours¹

Acc'y 1b—Principles of Accounting.....	3
G. E. D. 2—Descriptive Geometry.....	4
Rhet. 2—Rhetoric and Themes.....	3
Math. 6—Analytical Geometry.....	5
Phys. Tr. 2—Gymnasium.....	1
Mil. 1—Drill Regulations.....	1
Mil. 2b—Military Drill.....	1

Total18

SECOND YEAR

Econ. 1—Principles of Economics.....	5
Math. 8—Differential and Integral Calculus	5
Physics 1a—General Physics.....	3
Physics 3a—Physical Measurements.....	2
Tran. 7—Railway Organization.....	2
Mil. 2c—Military Drill.....	1

Total18

Econ. 3—Money and Banking.....	3
Physics 1b—General Physics.....	2
Physics 3b—Physical Measurements.....	2
Rhet. 10—Business Writing.....	2
Trans. 12—Freight Shipment.....	2
T. & A. M. 20—Analytical Mechanics....	3
Mil. 2d—Military Drill.....	1
Electives	0-3

Total15-18

THIRD YEAR

Bus. Law 1a—Commercial Law.....	3
Bus. Org. & Op. 1—Business Organization and Operation	3
Trans. 1—Transportation System of the United States.....	3
Trans. 13—Railway Traffic Administration or	
Trans. 17—Railway Terminal Management	3
Electives	3-6

Total15-18

Bus. Law 1b—Commercial Law.....	3
C. E. 76—Surveying.....	2
M. E. 2—Steam Engineering.....	3
Trans. 2—Transportation Policy in Europe and the United States.....	3
Trans. 22—Railway Train Service or	
Trans. 26—Economics of Railway Location and Maintenance	3
Electives	1-4

Total15-18

¹Semester hours. For definition, see page 85.

FOURTH YEAR

Econ. 12a—Labor Problems.....	3	E. E. 12—Alternating Current Apparatus..	3
E. E. 11—Direct Current Apparatus.....	3	E. E. 62—Alternating Current Laboratory..	1
E. E. 61—Direct Current Laboratory.....	1	Econ. 10—Corporation Management and	
M. E. 61—Power Measurement.....	2	Finance or	
Rhet. 25—Conference on Written Work...	1	Econ. 12b—Labor Problems.....	3
Trans. 17—Railway Terminal Management		Rhet. 26—Conference on Written Work...	1
or		Trans. 26—Economics of Railway Location	
Trans. 13—Railway Traffic Administration..	3	and Maintenance or	
Electives	2-5	Trans. 22—Railway Train Service.....	3
		Electives	4-7
Total	15-18	Total	15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

FIRST SEMESTER

T. & A. M. 21—Analytical Mechanics....	2
T. & A. M. 29—Resistance of Materials...	5
Trans. 1—Transportation System.....	3
Trans. 13—Railway Administration or	
Trans. 17—Railway Terminal Management	3
Electives	3-5
Total	15-18

SECOND SEMESTER

M. E. 2—Steam Engineering.....	3
Trans. 2—Transportation Policy in Europe	
and the United States.....	3
Trans. 22—Railway Train Service or	
Trans. 26—Economics of Railway Location	
and Maintenance	3
Electives	6-9
Total	15-18

FOURTH YEAR FOR THE CLASS OF 1917

Acc'y 1a—Principles of Accounting.....	3	Acc'y 1b—Principles of Accounting.....	3
Econ. 12a—Labor Problems.....	3	C. E. 76—Surveying.....	2
E. E. 11 and 61—Direct Current.....	4	Econ. 12b—Labor Problems.....	3
M. E. 62—Mechanical Engineering.....	3	E. E. 12 and 62—Alternating Current....	4
Rhet. 25—Conference on Written Work...	1	Rhet. 26—Conference on Written Work...	1
Trans. 17—Railway Terminal Management		Trans. 26—Economics of Railway Location	
or		and Maintenance or	
Trans. 13—Railway Traffic Administration..	3	Trans. 22—Railway Train Service.....	3
Trans. 35a—Thesis	2	Trans. 35b—Thesis	2
Total	19	Total	18

Curriculum for Commercial Teachers

Under the New Requirements for Graduation

The first and second years are the same as in the General Business Curriculum except that foreign language is prescribed in the first year, and Psychology 1—Introduction to Psychology (3) and Psychology 2—General Psychology (3) in the second year.

THIRD YEAR

FIRST SEMESTER

	Hours ¹
Bus. Law 1a—Commercial Law.....	3
Bus. Org. and Op. 1—Business Organiza-	
tion and Operation.....	3
Educ. 1—Introduction to Education.....	4
Pol. Sci. 1—American Government.....	3
Trans. 1—Transportation System of the	
United States	3
Electives	0-2
Total	16-18

SECOND SEMESTER

	Hours ¹
Bus. Law 1b—Commercial Law.....	3
Econ. 10—Corporation Management and	
Finance	3
Educ. 2—History of Education.....	5
Pol. Sci. 3—State and Local Government..	3
Trans. 12—Freight Shipment.....	2
Electives	2-5
Total	15-18

¹Semester hours. For definition, see page 85.

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship.....	3
Econ. 28—Domestic Commerce.....	3
Educ. 15—Social Education.....	3
Rhet. 25—Conference on Written Work...	1
Electives	5-8

Total15-18

Bus. Org. and Op. 8—Advertising.....	3
Econ. 29—Foreign Commerce or	
Econ. 31—Organization of Foreign Com-	
merce	3
Educ. 10—The Technique of Teaching....	3
Rhet. 26—Conference on Written Work...	1
Electives	5-8

Total15-18

Under the Old Requirements for Graduation

THIRD YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Acc'y 1a—Principles of Accounting.....	3
Econ. 10—Corporation Management.....	3
Econ. 28—Domestic Commerce.....	3
Educ. 1—Principles of Education.....	4

Total13

Suggested Electives

Bus. Org. and Op. 1—Business Organiza-	
tion and Operation.....	3
Econ. 5—Public Finance.....	3
Foreign language continued.....	
History	
Phil. 1—Logic	3
Pol. Sci. 4—Municipal Government.....	3
Rhet. 22—Summarizing and Abstracting..	2

Prescribed Subjects

Acc'y 1b—Principles of Accounting.....	3
Bus. Org. and Op. 2—Organization and	
Control of Mercantile Distribution....	3
Econ. 29—Foreign Commerce or	
Econ. 31—Organization of Foreign Com-	
merce	3
Educ. 2—History of Education.....	5

Total14

Suggested Electives

Educ. 6—Principles of Secondary School	
Education	3
Foreign language continued.....	
History	
Phil. 2—Introduction to Philosophy.....	3

FOURTH YEAR FOR THE CLASS OF 1917

Bus. Law 1a—Commercial Law.....	3
Econ. 12a—Labor Problems.....	3
Educ. 10—Observation and Technics of	
Teaching	3
Rhet. 25—Conference on Written Work...	1

Total10

Suggested Electives

Acc'y 2a—Advanced Accounting and Au-	
ditig	3
Bus. Org. and Op. 3—Business Procedure.	2
Econ. 4—Financial History of United	
States	3
Econ. 9—Practical Banking.....	2
Phil. 9—Political Ethics.....	2

Prescribed Subjects

Bus. Law 1b—Commercial Law.....	3
Econ. 12b—Labor Problems.....	3
Educ. 16—Social Education or	
Educ. 15—School Hygiene.....	2 or 3
Rhet. 26—Conference on Written Work...	1

Total9 or 10

Suggested Electives

Acc'y 2b—Advanced Accounting and Aud-	
iting	3
Bus. Org. and Op. 4—Industrial Organiza-	
tion and Management.....	2
Econ. 8—The Money Market.....	2
Econ. 21—Socialism and Economic Re-	
form	2
Trans. 12—Freight Shipment.....	2

Curriculum in Foreign Commerce

Under the New Requirements for Graduation

The first and second years of this curriculum are the same as in the General Business Curriculum except that foreign language is prescribed throughout both years.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Org. & Op. 1—Business Organization and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution.....	3
Econ. 28—Domestic Commerce.....	3	Econ. 29—Foreign Commerce.....	3
Foreign Language.....	2 or 4	Econ. 10—Corporation Management and Finance	3
Hist. 3a—History of the United States....	3	Foreign Language	2 or 3
Electives	0-2	Hist. 3b—History of the United States....	3
Total	16-18	Total	17-18

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship.....	3	Econ. 8—The Money Market.....	2
Econ. 9—Practical Banking.....	2	Econ. 31—Organization of Foreign Commerce	3
Advanced History	3	Pol. Sci. 7—American Diplomacy.....	3
Pol. Sci. 6—International Law.....	3	Advanced History.....	3
Rhet. 25—Conference on Written Work... 1		Rhet. 26—Conference on Written Work... 1	
Electives	3-6	Electives	3-6
Total	15-18	Total	15-18

Industrial Administration

Under the New Requirements for Graduation

The following curriculum is intended to meet the needs of commerce students planning to enter the administrative or selling departments of industrial plants. To the usual courses in economics, accounting, etc., are added certain groups of technical courses offered by other colleges of the University. For the present four such groups have been arranged, as follows: Group A, for those interested in the machine industries; Group B, the electrical industries; Group C, the building trades; Group D, the chemical industries. The student may select such one of these groups as will be most advantageous to him in his future work, but is required to take all the courses listed in the chosen group. The student electing the chemical industries group is required to take Econ. 26—Economic Resources (3) and Econ. 22—Economic History of the United States (3), instead of G. E. D. 1—Elements of Drafting (4) and G. E. D. 2—Descriptive Geometry (4), in the first year; and Chem. 1 or 1a—Inorganic Chemistry (5 or 3), instead of Economics 22—Economic History of the United States (3) and T. & A. M. 20—Analytical Mechanics (3), in the second year.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 1a—Principles of Accounting.....	3	Acc'y 1b—Principles of Accountancy.....	3
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Electives	0-1	Electives	0 or 1
Total	17-18	Total	17-18

¹Semester hours. For definition, see page 85.

SECOND YEAR

Econ. 1—Principles of Economics..... 5	Econ. 3—Money and Banking..... 3
Math. 8—Differential and Integral Calculus..... 5	Econ. 23—Statistics..... 3
Phys. 1a—General Physics..... 3	Phys. 1b—General Physics..... 2
Phys. 3a—Physical Measurements..... 2	Phys. 3b—Physical Measurements..... 2
Rhet. 10—Business Writing..... 2	Econ. 22—Economic History of the United States..... 3
Mil. 3a—Military Drill..... 1	T. & A. M. 20—Analytical Mechanics.... 3
	Mil. 2d—Military Drill..... 1
	Electives..... 0-1
Total..... 18	Total..... 17-18

THIRD YEAR

Bus. Org. & Op. 1—Business Organization and Operation..... 3	Bus. Org. & Op. 2—Organization and Control of Mercantile Distribution.... 3
Bus. Law 1a—Commercial Law..... 3	Bus. Law 2b—Commercial Law..... 3
Trans. 1—Transportation System of the United States..... 3	Trans. 12—Freight Rates..... 2
Prescribed technical courses, Group A, B, C, or D..... 2-6	Prescribed Technical Courses, Group A, B, C, or D..... 3-6
Electives..... 0-7	Electives..... 1-7
Total..... 15-18	Total..... 15 or 18

FOURTH YEAR

Bus. Org. & Op. 7—Salesmanship..... 3	Bus. Org. & Op. 8—Advertising..... 3
Econ. 12a—Labor Problems, or Electives.. 3	Rhet. 26—Conference on Written Work... 1
Rhet. 25—Conference on Written Work.. 1	Econ. 12b—Labor Problems or Finance..... 3
Prescribed Technical Courses, Group A, B, C, or D..... 3-9	Prescribed Technical Courses, Group A, B, C, or D..... 2-10
Electives..... 0-8	Electives..... 0-9
Total..... 16-18	Total..... 17 or 18

Optional Groups of Technical Courses

GROUP A:

THIRD YEAR

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
T. & A. M. 21—Analytical Mechanics.... 2		M. E. 75—Forge Work..... 1	
		M. E. 77—Foundry Work..... 2	
		M. E. 2—Steam Engineering..... 3	

FOURTH YEAR

SECOND SEMESTER	Hours ¹	FIRST SEMESTER	Hours ¹
M. E. 61—Power Measurement..... 2		E. E. 12—Alternating Current Apparatus.. 3	
M. E. 81—Machine Work..... 3		E. E. 62—Alternating Current Laboratory. 1	
E. E. 11—Direct Current Apparatus..... 3			
E. E. 61—Direct Current Laboratory..... 1			

GROUP B:

THIRD YEAR

FIRST SEMESTER	SECOND SEMESTER
T. & A. M. 21—Analytical Mechanics.... 2	M. E. 2—Steam Engineering..... 3

FOURTH YEAR

FIRST SEMESTER	SECOND SEMESTER
M. E. 61—Power Measurement..... 2	E. E. 12—Alternating Current Apparatus.. 4
E. E. 11—Direct Current Apparatus.... 4	E. E. 62—Electrical Engineering Laboratory 2
E. E. 61—Electrical Engineering Laboratory 2	E. E. 90—Lighting..... 1

¹Semester hours. For definition, see page 85.

GROUP C:

THIRD YEAR

FIRST SEMESTER

Arch. Eng. 43—Working Drawings.....	2
T. & A. M. 25—Resistance of Materials..	4

SECOND SEMESTER

T. & A. M. 26—Analytical Mechanics and Hydraulics	4
Arch. Eng. 44—Working Drawings.....	2

FOURTH YEAR

FIRST SEMESTER

Arch. Eng. 45—Graphic Statics.....	3
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SECOND SEMESTER

C. E. 76—Surveying	2
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GROUP D:

THIRD YEAR

FIRST SEMESTER

Chem. 2a—Inorganic Chemistry and Quali- tative Analysis.....	5
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SECOND SEMESTER

Chem. 5a—Elementary Quantitative Anal- ysis	5
--	---

FOURTH YEAR

FIRST SEMESTER

Chem. 9c—Organic Synthesis.....	2
Chem. 14a—Organic Chemistry.....	4
Chem. 92a—Journal Meeting.....	1

SECOND SEMESTER

Chem. 6—Chemical Technology.....	3
Chem. 31—Elementary Physical Chemistry. .	4
Chem. 33—Elementary Physical Chemistry	2
Chem. 92b—Journal Meeting.....	1

Curriculum in Commerce and Law

(A six-year combined curriculum)

Under the New Requirements for Graduation

The following curriculum is provided for students who wish to combine commercial and legal studies and secure both the degree of Bachelor of Science and the degree of Bachelor of Laws or of Doctor of Law in six years. Students who elect this curriculum must meet all the requirements for graduation from the College of Commerce and Business Administration, but in exercising their privileges of election are urged to select as many hours as possible from the following subjects: Hist. 2a-2b, English History (6); Hist. 3a-3b, United States History (6); Hist. 4a-4b, English Constitutional History (6); Pol. Sci. 1, American Government (3); and Pol. Sci. 3, State and Local Government (3). Students expecting to study law should devote at least 12 hours to work in history and political science. A course in English history is regarded as one of the most essential pre-legal subjects. The law courses in the curriculum may be taken only in the fourth year, and are counted for 30 hours of credit towards the degree, instead of hour for hour, provided the full year's work is completed. In their fourth year students will be regularly registered in the College of Law, but must file copies of their study-lists in the office of the Dean of the College of Commerce and Business Administration at the beginning of each semester.

FIRST YEAR

FIRST SEMESTER

	Hours ¹
Acc'y 1—Principles of Accounting.....	3
Econ. 26—Economic Resources.....	3
Rhet. 1—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hy- giene	1
Mil. 2a—Military Drill.....	1
Electives	4-7

Total 15-18

SECOND SEMESTER

	Hours ¹
Acc'y 1b—Principles of Accounting.....	3
Econ. 22—Economic History of the United States	3
Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 2—Gymnasium.....	1
Mil. 1—Drill Regulations.....	1
Mil. 2b—Military Drill.....	1
Electives	3 or 6

Total 15 or 18

¹Semester hours. For definition, see page 85.

SECOND YEAR

Acc'y 2—Advanced Accounting and Auditing	3	Acc'y 2b—Advanced Accounting and Auditing	3
Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Rhet. 10—Business Writing.....	2	Phil. 1—Logic.....	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Drill.....	1
Electives	4-7	Electives	5-8
Total	15-18	Total	15-18

THIRD YEAR

Bus. Org. & Op. 1—Business Organization and Operation.....	3	Bus. Org. & Op. 2—Organization and Control of Mercantile Distribution.....	3
Econ. 5—Public Finance.....	3	Econ. 10—Corporation Finance.....	3
Econ. 28—Domestic Commerce.....	3	Electives	9-12
Electives	6-9		
Total	15-18	Total	15-18

FOURTH YEAR

Law 1a—Contracts	4	Law 1b—Contracts	3
Law 2a—Torts	3	Law 2b—Torts	3
Law 5—Criminal Law.....	4	Law 3—Real Property.....	3
Law 6—Personal Property.....	2	Law 7—Domestic Relations.....	2
Law 37—Introduction to Study of Law....	1	Law 11—Agency	3
Total	14	Total	14

THE COLLEGE OF ENGINEERING

Engineering students should read the General Directions for Registration given in paragraphs 1-29 on pages 9-15. They should report for registration to Engineering Hall, where further special directions will be furnished them.

GENERAL ENGINEERING LECTURES FOR FRESHMEN

One general lecture sufficiently popular in character to interest and inspire young students will be given each week. All freshman students in engineering are required to attend this lecture.

SUMMER READING

All engineering students not graduates of a college of liberal arts and sciences are required to complete prescribed courses of reading of a non-professional character during the summer vacations following the freshman and sophomore years. A circular on summer reading is issued, containing a list of books from which the student may choose. A statement of the books read during the summer is required at the beginning of the next college year.

TRIPS OF INSPECTION

An inspection trip is one of the regular requirements in the senior year of the curriculums leading to the degree of Bachelor of Science in architecture, architectural engineering, ceramic engineering, electrical engineering, mechanical engineering, mining engineering, municipal and sanitary engineering, and railway engineering.

The time required for these trips is three or four days, and the plants visited are usually in Chicago or Milwaukee. The trips are taken during term time under the supervision of University authorities. The expense to each student varies from \$15.00 to \$25.00.

NON-TECHNICAL ELECTIVES

The non-technical electives for students in the College of Engineering are subject to the following restrictions:

1. They are restricted to courses offered in the College of Liberal Arts and Sciences and in the College of Commerce.
2. Such courses must not be open to freshman students.
3. The courses must be approved by the head of the department in which the student making the election is registered.

RHETORIC PREREQUISITE FOR JUNIOR STANDING

At its meeting of June 7, 1915, the University Senate approved the following recommendations of the College of Engineering with reference to requirements in the subject of rhetoric:

1. Rhetoric 1 and 2 shall hereafter be a prerequisite for junior standing in the College of Engineering, and no student in this College shall be permitted to register in more than eight hours of prescribed junior work without having passed or being registered in Rhetoric 1 or 2.
2. Any student in the College of Engineering whose written work shows that he is unable to use good English shall be reported by his instructor to a standing committee of the College of Engineering appointed for this purpose, which committee shall have authority to direct the student to take as a prerequisite for graduation such additional instruction in rhetoric as may be prescribed by the department of English.

CURRICULUMS IN ENGINEERING

The several engineering curriculums are in process of transition between a former schedule followed by the classes entering prior to the year 1914-15 and a new schedule which will be effective for the freshman class of that year and for subsequent classes.

The outlines which follow, except that of the curriculum in architecture, show the work of each year in the several curriculums *as taught during 1916-17. They do not show either the old or the new curriculum as a whole.* Freshmen will take the "First Year" as here scheduled; and regular sophomores, juniors, and seniors will take the "Second Year," "Third Year," and "Fourth Year," respectively; but these schedules *must not be used* for checking up on a student's previous work in his curriculum or in planning the work of subsequent years. For such work or planning consult with the Assistant Dean of the College.

Curriculum in Architecture

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Arch. 31 ² —Arch. and Freehand Drawing..	4	Arch. 32—Arch. and Freehand Drawing...	4
G. E. D. 2—Descriptive Geometry.....	4	Chem. 1a ³ or 1b—Inorganic Chemistry 3 or 4	
Math. 2—Advanced Algebra.....	3	Rhet. 2—Rhetoric and Themes.....	3
Math. 4—Trigonometry	2	T. & A. M. 14—Elem. Mechanics.....	4
Rhetoric 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	18	Total	17 or 18

Summer Reading, 50 points

SECOND YEAR

Arch. 13—History of Architecture.....	2	Arch. 14—History of Architecture.....	2
Arch. 23—Freehand Drawing.....	2	Arch. 24—Freehand Drawing.....	2
Arch. 33—Design	3	Arch. 34—Design	3
Arch. 43—Working Drawings.....	3	Arch. 44—Working Drawings.....	3
Phys. 9a—Physics Lectures.....	2	Phys. 9b—Physics Lectures.....	2
Phys. 10a—Physics Laboratory.....	2	Phys. 10b—Physics Laboratory.....	2
T. & A. M. 15—Strength of Materials..	3	T. & A. M. 16—Strength of Materials...	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Total	18	Total	18

Summer Reading, 50 points

¹Semester hours. For definition, see page 85.

²The numbers refer to courses in the Description of Courses, pages 85ff.

³Students who have had chemistry in the high school equivalent to Chemistry 1b will register in Chemistry 1a.

THIRD YEAR

Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture.....	2
Arch. 25—Freehand Drawing.....	2	Arch. 26—Freehand Drawing.....	2
Arch. 35—Design	5	Arch. 36—Design	5
Arch. 45—Graphic Statics.....	3	Arch. 46—Roofs	3
Arch. 55—Building Sanitation.....	1	Arch. 66—Theory of Architecture.....	1
Arch. 65—Theory of Architecture.....	1	E. E. 90—Building Illumination.....	1
French or German.....	4	French or German.....	4
Total	18	Total	18

FOURTH YEAR

Arch. 27—Freehand Drawing.....	2	Arch. 28—Freehand Drawing.....	2
Arch. 37—Design	7	Arch. 38—Advanced Design or Thesis.....	7
Arch. 67—Theory of Form and Color.....	2	Arch. 60—Special Lectures.....	1
*Arch. 99—Non-technical Elective.....	5	Arch. 68—Specifications	3
M. E. 25—Heating and Ventilation.....	2	*Non-technical Elective.....	3
Inspection Trip.....	0		
Total	18	Total	16

Curriculum in Architectural Engineering as Taught in 1916-17

FIRST YEAR FOR CLASS OF 1920

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry..	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Desc. Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR FOR CLASS OF 1919

Arch. 13—History of Architecture.....	2	Arch. 14—History of Architecture.....	2
A. E. 33—Arch. and Freehand Drawing..	3	A. E. 34—Design	3
A. E. 43—Working Drawings.....	2	A. E. 44—Working Drawings.....	2
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 2b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytical Mech.....	3
		Mil. 2d—Military Drill.....	1
Total	18	Total	18
Summer Reading, 50 points			

THIRD YEAR FOR THE CLASS OF 1918

Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture.....	2
A. E. 35—Design	3	A. E. 36—Design	3
A. E. 45—Graphic Statics.....	3	A. E. 46—Graphic Statics.....	3
Chem. 1a or 1b—Inorganic Chem.....	3 or 4	Chem. 4—Qualitative Analysis.....	4
T. & A. M. 25—Resistance of Materials..	4	T. & A. M. 26—Analytic Mechanics and	
Non-technical Elective.....	2	Hydraulics	4
		Non-technical Elective.....	2
Total	17 or 18	Total	18

¹Any approved non-technical course. See page 50.

FOURTH YEAR FOR THE CLASS OF 1917

A. E. 47—Architectural Engineering.....	5	A. E. 48—Architectural Engineering.....	5
A. E. 57—Fireproof Construction.....	2	A. E. 58—Fireproof Construction.....	2
A. E. 67—Building Sanitation.....	2	A. E. 68—Estimates and Specifications....	4
A. E. 99—Inspection Trip.....	0	E. E. 92—Lighting and Wiring.....	2
M. E. 23—Mech. Equipment of Buildings..	5	Non-technical Elective.....	3
Non-technical Elective.....	3		
Total	17	Total	16

Revised Curriculum in Ceramic Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.....	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 5b—Quantitative Analysis.....	5
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Min. 3—Mining Principles.....	2	T. & A. M. 20—Analytical Mechanics....	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
		*Non-technical Elective	3
Total	18	Total	19

Summer Reading, 50 points

THIRD YEAR FOR THE CLASS OF 1918

Cer. 2—Winning and Preparation of Clays	3	Cer. 3—Industrial Calculations	3
Chem. 65—Gas and Fuel Analysis.....	2	Cer. 5—Ceramic Bodies	5
Language	4	Cer. 12—Design and Shaping.....	3
T. & A. M. 21—Analytic Mechanics.....	2	C. E. 76—Surveying	2
T. & A. M. 25—Resistance of Materials..	4	Language	4
*Non-technical Elective	3		
Total	18	Total	17

FOURTH YEAR FOR THE CLASS OF 1917

Cer. 4—Drying and Burning.....	4	Cer. 8—Glass	2
Cer. 6—Glazes	5	Cer. 9—Ceramic Construction.....	4
Cer. 17—Silicates	3	Geol. 13b—Engineering Geology.....	3
Cer. 99—Inspection Trip.....	0	M. E. 62—M. E. Laboratory.....	3
Geol. 13a—Engineering Geology.....	3	Thesis or Technical Elective.....	3
*Non-technical Elective.....	3		
Total	18	Total	15

*Any approved non-technical course. See page 50.

¹Semester hours. For definition, see page 85.

Curriculum in Civil Engineering as Taught in 1916-17

FIRST YEAR FOR THE CLASS OF 1920

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a o 1b—Inorganic Chemistry.....	3 or 4	Chem. 4—Inorganic Chemistry.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture	0	Engineering Lecture	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1919

C. E. 27—Plane Surveying.....	3	C. E. 28—Higher Surveying.....	3
Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lecture.....	3	Phys. 1b—Physics Lecture.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytic Mechanics.....	3
		Mil. 2d—Military Drill.....	1
Total	18	Total	18

Summer Reading, 50 points

THIRD YEAR FOR THE CLASS OF 1918

C. E. 51—Railroad Surveying.....	5	C. E. 52—Roads and Pavements.....	3
M. E. 1—Steam Engines and Boilers.....	3	C. E. 60—Structural Stresses.....	4
T. & A. M. 21—Analytical Mechanics.....	2	C. E. 62—Structural Details.....	2
T. & A. M. 29—Resistance of Materials... 5		C. E. 70—Seminar.....	1
*Non-technical Elective	3	T. & A. M. 10—Hydraulics.....	3
		*Non-technical Elective.....	3
Total	18	Total	16

FOURTH YEAR FOR THE CLASS OF 1917

I. General Civil Engineering Option

C. E. 77—Masonry Construction.....	4	C. E. 80—Contracts and Specifications....	2
C. E. 79—Cement Laboratory.....	1	E. E. 4—Elementary Electrical Engineering	2
C. E. 81—Theory of Reinforced Concrete. 2		E. E. 64—Electrical Engineering Laboratory	1
C. E. 83—Bridge Design.....	3	M. & S. E. 3—Sewerage.....	3
C. E. 99—Inspection Trip.....	0	*Non-technical Elective.....	3
M. & S. E. 2—Water Supply Engineering. 4		Technical Elective.....	5
Technical Elective.....	3		
Total	17	Total	16

II. Structural Engineering Option

C. E. 77—Masonry Construction.....	4	C. E. 80—Contracts and Specifications....	2
C. E. 79—Cement Laboratory.....	1	C. E. 82—Concrete Design.....	4
C. E. 81—Theory of Reinforced Concrete. 2		C. E. 88—Steel Building Design.....	3
C. E. 85—Steel Bridge Design.....	5	M. & S. E. 3—Sewerage.....	3
C. E. 87—Advanced Bridge Analysis.....	2	*Non-technical Elective.....	3
C. E. 99—Inspection Trip.....	0		
M. & S. E. 2—Water Supply Engineering. 4			
Total	18	Total	15

*Any approved non-technical course. See page 50.

¹Semester hours. For definition, see page 85.

III. Highway Engineering Option

C. E. 77—Masonry Construction.....	4	C. E. 80—Contracts and Specifications....	2
C. E. 79—Cement Laboratory.....	1	C. E. 92—Concrete Bridges and Culverts..	2
C. E. 81—Theory of Reinforced Concrete..	2	C. E. 94—Highway Administration.....	3
C. E. 91—Highway Bridge Design.....	4	C. E. 96—Road Laboratory.....	2
C. E. 93—Road Construction.....	3	Chem. 73—Asphalt, Tar, etc.....	2
C. E. 99—Inspection Trip.....	0	Technical Elective.....	4
M. & S. E. 2—Water Supply Engineering..	4		

Total18

Total15

Technical Electives

C. E. 83—Bridge Design.....	3	C. E. 94—Highway Administration.....	3
C. E. 85—Steel Bridge Design.....	5	C. E. 96—Road Laboratory.....	2
C. E. 87—Advanced Bridge Analysis.....	2	C. E. 98—Thesis*	2 or 3
C. E. 91—Highway Bridge Design.....	4	Chem. 73—Asphalts, Tar, etc.....	2
C. E. 93—Road Construction.....	3	E. E. 4—Electrical Engineering.....	2
C. E. 97—Thesis*	1	E. E. 64—Electrical Engineering Laboratory	1
Min. 6a—M. E. of Mines.....	3	Min. 1—Earth and Rock Excavation.....	3
R. E. 33—Economy of Railway Location....	4	M. & S. E. 9—Hydraulic Design and Con-	
C. E. 76—General Surveying.....	2	struction	2
C. E. 82—Concrete Design.....	4	M. & S. E. 3—Sewerage.....	3
C. E. 88—Steel Building Design.....	3	R. E. 31—Railway Yards and Terminals..	3
C. E. 92—Concrete Bridges and Culverts..	2		

Curriculum in Electrical Engineering as Taught in 1916-17

FIRST YEAR FOR THE CLASS OF 1920

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1a or 1b—Inorganic Chemistry..	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR FOR THE CLASS OF 1919

Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 75 & 77—Forge and Foundry, or		M. E. 75 & 77—Forge and Foundry, or	
M. E. 79—Pattern Work.....	3	M. E. 79—Pattern Work.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytical Mechanics....	3
		Mil. 2b—Military Drill.....	1
Total	18	Total	18
Summer Reading, 50 points			

THIRD YEAR FOR THE CLASS OF 1918

Chem. 4—Qualitative Analysis.....	4	E. E. 26—Alternating Currents.....	4
E. E. 25—Direct Current Apparatus.....	4	E. E. 76—Elec. Eng. Laboratory.....	2
E. E. 75—Elec. Eng. Laboratory.....	2	M. E. 2—Steam Engineering.....	3
Math. 9a—Integral Calculus.....	2	Phys. 4b—Elec. and Mag. Measurement... 2	
Phys. 4a—Elec. and Mag. Measurement... 2		T. A. M. 26—Anal. Mechanics and Hy-	
T. A. M. 25—Resistance of Materials... 4		draulics	4
		†Non-technical Elective.....	3
Total	13	Total	18

*Only students having high grades may elect a thesis.

¹Semester hours. For definition, see page 85.

†Any approved non-technical course. See page 50.

FOURTH YEAR FOR THE CLASS OF 1917

E. E. 99—Inspection Trip.....	0	E. E. 96—Seminar	1
E. E. 95—Seminar	1	E. E. 36—Alternating Current Apparatus..	4
E. E. 35—Alternating Current Apparatus..	4	E. E. 86—Elec. Eng. Laboratory.....	2
E. E. 85—Elec. Eng. Laboratory.....	2	E. E. 56—Electrical Design.....	4
E. E. 55—Electrical Design.....	2	E. E. 98—Thesis* or elective.....	3
M. E. 61—Power Measurement.....	2	†Non-technical Elective.....	3
M. E. 11—Thermodynamics	3		
†Non-technical Elective.....	3		
Total	17	Total	17

Curriculum in Mechanical Engineering as Taught in 1916-17

FIRST YEAR FOR THE CLASS OF 1920

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.3 or 4		Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR FOR THE CLASS OF 1919

Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 75 & 77—Forge and Foundry, or		M. E. 75 & 77—Forge and Foundry, or	
M. E. 79—Pattern Work.....	3	M. E. 79—Pattern Work.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. A. M. 20—Analytic Mechanics.....	3
		Mil. 2d—Military Drill.....	1
Total	18	Total	18
Summer Reading, 50 points			

THIRD YEAR FOR THE CLASS OF 1918

Math. 9a—Integral Calculus.....	2	M. E. 12—Thermodynamics	5
M. E. 3—Steam Engineering.....	3	M. E. 30—Mechanics of Machinery.....	5
M. E. 81—Machine Work.....	3	M. E. 64—Power Measurement.....	3
T. & A. M. 21—Analytical Mechanics....	2	M. E. 82—Machine Work.....	2
T. & A. M. 29—Resistance of Material... 5		†Non-technical Elective.....	3
†Non-technical Elective.....	3		
Total	18	Total	18

FOURTH YEAR FOR THE CLASS OF 1917

E. E. 11—Direct Current Apparatus.....	3	E. E. 12—Alternating Current Apparatus..	3
E. E. 61—Direct Current Laboratory.....	1	E. E. 62—Alternating Current Laboratory. 1	
M. E. 15—Gas Power Engineering, or		M. E. 26—Heating and Ventilation.....	3
M. E. 37—Principles of Management....	3	M. E. 32—Power Transmission.....	3
M. E. 43—Engineering Design.....	5	M. E. 44—Engineering Design, or	
M. E. 65—Power Laboratory.....	3	M. E. 66—Power Laboratory.....	2
M. E. 99—Inspection Trip.....	0	M. E. 52—Power Plant Design.....	3
†Non-technical Elective.....	3		
Total	18	Total	15

*Only students having high grades may elect a thesis.

†Any approved non-technical course. See page 50.

¹Semester hours. For definition, see page 35.

Curriculum in Mining Engineering as Taught in 1916-17

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.....	4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytical Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR

Geol. 13a—Engineering Geology.....	3	Geol. 13b—Engineering Geology.....	3
Language.....	4	Language.....	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Physics 1a—Physics Lectures.....	3	Physics 1b—Physics Lectures.....	2
Physics 3a—Physics Laboratory.....	2	Physics 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytical Mechanics....	3
		Mil. 2d—Military Drill.....	1
Total	18	Total	18
Summer Reading, 50 points			

THIRD YEAR

Chem. 5b—Quantitative Analysis.....	4	C. E. 58—Graphic Statics.....	2
C. E. 35—Surveying.....	3	E. E. 4—Elementary Electrical Engineering	2
M. E. 1—Steam Engineering.....	3	E. E. 64—Electrical Engineering Laboratory	1
†Min. 1—Earth and Rock Excavation....	3	†Min. 4—Mining Methods.....	3
T. & A. M. 25—Resistance of Materials....	4	†Min. 6—Mechanical Engineering of Mines	2
		T. & A. M. 26—Analytic Mechanics and	
		Hydraulics	4
		*Non-technical Elective.....	3
Total	17	Total	17

FOURTH YEAR FOR THE CLASS OF 1917

I. Coal Mining Option

Chem. 7—Metallurgy.....	3	Min. 8—Mine Law, Admin. and Accounts.	3
Chem. 65—Technical Gas and Fuel Analysis	2	Min. 13—Utilization of Fuels.....	2
Min. 5—Mine Ventilation.....	3	Min. 42—Coal Plant Design.....	2
Min. 9—Coal and Ore Preparation.....	3	Min. 62—Mine Surveying.....	3
Min. 41—Principles of Coal Plant Design..	3	Min. 64—Coal Mining Laboratory.....	3
Min. 99—Inspection Trip.....	0	Min. 68—Mine Topography.....	1
*Non-technical Elective.....	3	Min. 90—Journal Meeting.....	1
		*Non-technical Elective.....	3
Total	17	Total	18

¹Semester hours. For definition, see page 85.

†Students in Metallurgical Option take *First Semester*: Chemistry 7—General Metallurgy, instead of Mining 1; *Second Semester*: Chemistry 5b—Advanced Quantitative Analysis instead of Mining 4 and Mining 6.

*Any approved non-technical course. See page 50.

II. Ore Mining Option

Chem. 7—Metallurgy.....	3	Geol. 2—Economic Geology.....	3
Chem. 69—Metallurgical Laboratory and Assaying	2	Min. 8—Mine Law, Administration and Accounts	3
Min. 15—Principles of Mine Ventilation..	1	Min. 44—Ore Plant Design.....	2
Min. 19—Ore and Coal Preparation.....	3	Min. 62—Mine Surveying.....	3
Min. 21—Mine Examination and Valuation 2		Min. 66—Ore Concentration Laboratory...	3
Min. 43—Principles of Ore Plant Design..	3	Min. 90—Journal Meeting.....	1
Min. 99—Inspection Trip.....	0	*Non-technical Elective.....	3
*Non-technical Elective.....	3		
Total	17	Total	18

III Metallurgical Option

Chem. 7—Metallurgy.....	3	Chem. 7a—Non-ferrous Metallurgy.....	3
Chem. 65—Technical Gas and Fuel Analysis 2		Chem. 78—Metallography.....	2
Chem. 69—Metallurgical Laboratory and Assaying	2	Min. 8—Administration and Accounts....	2
Min. 17—Problems	1	Min. 13—Utilization of Fuels.....	2
Min. 19—Ore and Coal Preparation.....	3	Min. 46—Mill and Smelter Design.....	2
Min. 45—Principles of Mill and Smelter Design	3	Min. 66—Ore Concentration Laboratory...	3
Min. 99—Inspection Trip.....	0	Min. 90—Journal Meeting.....	1
*Non-technical Elective.....	3	*Non-technical Elective.....	3
Total	17	Total	18

Curriculum in Municipal and Sanitary Engineering as Taught in 1916-17

FIRST YEAR FOR THE CLASS OF 1920

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.....	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19

Summer Reading, 50 points

SECOND YEAR FOR THE CLASS OF 1919

C. E. 27—Plane Surveying.....	3	C. E. 28—Higher Surveying.....	3
Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 2a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytical Mechanics...	3
		Mil. 2d—Military Drill.....	1
Total	18	Total	18

Summer Reading, 50 points

*Any approved non-technical course. See page 50.

¹Semester hours. For definition, see page 85.

THIRD YEAR FOR THE CLASS OF 1918

Botany 6—Bacteriology.....	2½	C. E. 52—Roads and Pavements.....	3
Chem. 106—Water Analysis.....	2½	C. E. 60—Structural Stresses.....	4
C. E. 53—Railroad Surveying.....	3	C. E. 62—Structural Details.....	2
T. & A. M. 21—Analytic Mechanics....	2	M. E. 2—Steam Engineering.....	3
T. & A. M. 29—Resistance of Materials.	5	T. & A. M. 10—Hydraulics.....	3
*Non-technical Elective.....	2	*Non-technical Elective.....	3
Total	17	Total	18

FOURTH YEAR FOR THE CLASS OF 1917

C. E. 77—Masonry Construction.....	4	C. E. 62—Structural Details.....	2
C. E. 79—Cement Laboratory.....	1	C. E. 80—Contracts and Specifications....	2
C. E. 81—Reinforced Concrete.....	2	E. E. 4—Elementary Electrical Engineering	2
M. E. 61—Steam Laboratory.....	2	E. E. 64—Electrical Engineering Laboratory	1
M. & S. E. 2—Water Supply Engineering..	4	M. & S. E. 3—Sewerage.....	3
M. & S. E. 6a—Water Purification and Sewage Disposal.....	3	M. & S. E. 6b—Water Purification and Sewage Disposal.....	2
M. & S. E. 99—Inspection Trip.....	0	M. & S. E. 9—Hydraulic Design and Con- struction	2
*Non-technical Elective.....	2	M. & S. E. 98—Thesis or Approved Elective	3
Total	18	Total	17

Curriculum in Railway Civil Engineering as Taught in 1916-17

FIRST YEAR FOR THE CLASS OF 1920

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.3 or 4		Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Military Drill.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Drill Regulations.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR FOR THE CLASS OF 1919

C. E. 27—Surveying.....	3	C. E. 28—Topographical Surveying.....	3
Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 2c—Military Drill.....	1	T. & A. M. 20—Analytic Mechanics.....	3
Total	18	Mil. 2d—Military Drill.....	1
		Total	18
		Summer Reading, 50 points	

THIRD YEAR FOR THE CLASS OF 1918

C. E. 51—Railroad Surveying.....	5	C. E. 60—Structural Stresses.....	4
R. E. 25—Railway Development.....	3	R. E. 31—Railway Yards and Terminals...	3
T. & A. M. 21—Analytic Mechanics.....	2	R. E. 34—Railway Maintenance.....	4
T. & A. M. 29—Resistance of Materials..	5	T. & A. M. 10—Hydraulics.....	3
*Non-technical Elective.....	3	*Non-technical Elective.....	3
Total	18	Total	17

*Any approved non-technical course. See page 50.

¹Semester hours. For definition, see page 85.

FOURTH YEAR FOR THE CLASS OF 1917

C. E. 77—Masonry Construction.....	4	C. E. 80—Engineering Construction and Specifications	2
C. E. 79—Cement Laboratory.....	1	E. E. 4—Elementary Electrical Engineering	2
C. E. 81—Reinforced Concrete Theory....	2	E. E. 64—Electrical Engineering Laboratory	1
C. E. 83—Bridge Design.....	3	R. E. 30—Thesis	3
M. E. 11—Steam Engines and Boilers....	3	R. E. 33—Railway Location.....	4
R. E. 32—Railway Construction.....	3	R. E. 51—Seminar	1
R. E. 35—Railway Signaling.....	1	*Non-technical Elective.....	3
R. E. 50—Seminar	1		
R. E. 99—Inspection Trip.....	0		
Total	18	Total	16

Curriculum in Railway Electrical Engineering as Taught in 1916-17

FIRST YEAR FOR THE CLASS OF 1920

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.3 or 4		Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Plane Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR FOR THE CLASS OF 1919

Language	4	Language	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 75—Forge Work.....	1	M. E. 79—Pattern Work.....	3
M. E. 77—Foundry Work.....	2	Phys. 1b—Physics Lectures.....	2
Phys. 1a—Physics Lectures.....	3	Phys. 3b—Physics Laboratory.....	2
Phys. 3a—Physics Laboratory.....	2	T. & A. M. 20—Analytic Mechanics.....	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Total	18	Total	18
Summer Reading, 50 points			

THIRD YEAR FOR THE CLASS OF 1918

E. E. 25—Direct Current Apparatus.....	4	E. E. 26—Alternating Currents.....	4
E. E. 75—Electrical Laboratory.....	2	E. E. 76—Electrical Laboratory.....	2
M. E. 81—Machine Work.....	3	M. E. 2—Steam Engineering.....	3
Phys. 4a—Electrical and Magnetic Measurements	2	Phys. 4b—Electrical and Magnetic Measurements	2
R. E. 25—Railway Development.....	3	R. E. 60—Electric Railway Principles....	2
T. & A. M. 25—Resistance of Materials... 4		T. & A. M. 36—Analytic Mechanics.....	2
Total	18	*Non-technical Elective.....	3
		Total	18

FOURTH YEAR FOR THE CLASS OF 1917

M. E. 11—Thermodynamics	3	E. E. 56—Electrical Design.....	4
M. E. 61—Mechanical Laboratory.....	2	R. E. 63—Electric Railway Laboratory....	2
R. E. 62—Electric Railway Laboratory....	2	R. E. 65—Electric Railway Economics....	4
R. E. 64—Electric Railway Practise.....	3	R. E. 30—Thesis (or elective).....	3
R. E. 66—Electric Railway Machinery....	3	*Non-technical Elective.....	3
R. E. 67—Seminar	1		
R. E. 99—Inspection Trip.....	0		
*Non-technical Elective.....	3		
Total	17	Total	16

*Any approved non-technical course. See page 50.

¹Semester hours. For definition, see page 85.

Curriculum in Railway Mechanical Engineering as Taught in 1916-17

FIRST YEAR FOR THE CLASS OF 1920

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1b or 1a—Inorganic Chemistry.....	3 or 4	Chem. 4—Advanced Chemistry.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1—Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1—Gymnasium.....	1	Mil. 1—Drill Regulations.....	1
Mil. 2a—Military Drill.....	1	Mil. 2b—Military Drill.....	1
Engineering Lecture.....	0	Engineering Lecture.....	0
Total	17 or 18	Total	19
Summer Reading, 50 points			

SECOND YEAR FOR THE CLASS OF 1919

Language	4	Language	4
Math. 7—Differential Calculus.....	5	M. E. 75—Forge Work.....	1
M. E. 79—Pattern Work.....	3	M. E. 77—Foundry Work.....	2
Phys. 1a—Physics Lectures.....	3	Math. 9—Integral Calculus.....	3
Phys. 3a—Physics Laboratory.....	2	Phys. 1b—Physics Lectures.....	2
Mil. 2c—Military Drill.....	1	Phys. 3b—Physics Laboratory.....	2
Total	18	T. & A. M. 20—Analytic Mechanics.....	3
Summer Reading, 50 points		Mil. 2d—Military Drill.....	1
		Total	18

THIRD YEAR FOR THE CLASS OF 1918

Math. 9a—Integral Calculus.....	2	M. E. 12—Thermodynamics	5
M. E. 81—Machine Work.....	3	M. E. 64—Power Measurement.....	3
R. E. 25—Railway Development.....	3	M. E. 82—Machine Work.....	2
T. & A. M. 21—Analytic Mechanics.....	2	R. E. 6—Locomotives.....	4
T. & A. M. 29—Resistance of Materials.....	5	*Non-technical Elective.....	3
*Non-technical Elective.....	3	Total	17
Total	18		

FOURTH YEAR FOR THE CLASS OF 1917

E. E. 11—Direct Current Apparatus.....	3	E. E. 12—Alternating Current Apparatus..	3
E. E. 61—Direct Current Laboratory.....	1	E. E. 62—Alternating Current Laboratory..	1
M. E. 37—Science of Management.....	3	R. E. 7—Advanced Design.....	3
R. E. 2—Locomotive Design.....	3	R. E. 8—Railway Laboratory.....	2
R. E. 5—Railway Laboratory.....	3	R. E. 30—Thesis	3
R. E. 9—Seminar	1	R. E. 61—Traction	3
R. E. 99—Inspection Trip.....	0	*Non-technical Elective.....	2
*Non-technical Elective.....	3	Total	17
Total	17		

*Any approved non-technical course. See page 50.

¹Semester hours. For definition, see page 85.

THE COLLEGE OF AGRICULTURE

Agricultural students should read the General Directions for Registration given in paragraphs 1-29 on pages 9-15. Further special directions will be furnished them with their study-lists.

REQUIREMENTS FOR GRADUATION

Students who have satisfied all matriculation requirements and have maintained throughout their course a satisfactory record of scholarship and moral character will be graduated with the degree of Bachelor of Science, upon having completed the studies of the prescribed list and sufficient electives to make a total of 130 semester hours.

A thesis is not required for graduation, but any student who has completed not less than 90 hours of credit before the senior year may then elect a thesis course in any department in which he has done not less than 20 hours' work, subject to the approval of the head of the department in question.

Graduates of approved colleges may expect to secure a degree in agriculture from the University of Illinois upon completion of the technical and scientific requirements. This will ordinarily require approximately two years of residence work; a minimum of one year is required.

General Curriculum in Agriculture

All students except those in the special curriculums in household science, floriculture, and landscape gardening are required to take the same work during the freshman year and part of the sophomore year. This work gives the student a correct conception of the fundamental farm practices and an insight into the technical branches of agriculture, such as animal and dairy husbandry, horticulture, farm crops, soils, farm mechanics, and buildings, and leaves the junior and senior years open for elective studies.

One hundred thirty hours are required for graduation, as follows:

Agriculture prescribed first two years.....	19 hours
Agriculture prescribed as electives.....	40 hours
<hr/>	
Total agriculture required.....	59 hours
Non-agriculture prescribed	42 hours
Non-agriculture prescribed as electives.....	15 hours
<hr/>	
Total non-agriculture required.....	57 hours
Open electives	14 hours
<hr/>	
	130 hours

PRESCRIBED SUBJECTS

Required for the Degree of Bachelor of Science in the General Curriculum in Agriculture

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Ag. Ext. 4—Country Life Problems.....	1	A. H. 5—Live Stock Judging.....	3
Agron. 25—Farm Crops.....	4	Chem. 2a—Inorganic Chemistry and Qualitative Analysis.....	5
Chem. 1a or 1—Inorganic Chemistry..	3 or 5	D. H. 3—Elements of Dairy Husbandry...	1
Hort. 1a—Elements of Horticulture.....	2	Hort. 1b—Elements of Horticulture.....	2
Rhet. 1*—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
Electives	0-3	Mil. 2—Military Drill.....	1
	—	Elective	1
Total	15-18	Total	18

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
A. H. 8 and 21—Principles of Breeding and Feeding.....	3	A. H. 8 and 21—Principles of Breeding and Feeding.....	3
Botany 1—General Botany.....	5	Botany 1—General Botany.....	5
or	—	or	—
Agronomy 26—Elementary Farm Mechanics	3	Agronomy 26—Elementary Farm Mechanics	3
Chemistry 13a—Elementary Quantitative Analysis	5	Chemistry 13a—Elementary Quantitative Analysis	5
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1
Electives	6-9	Electives	6-9
	—		—
Total	15-18	Total	15-18

In addition to the prescribed subjects, students will take the following:

Agriculture, electives	40 hours
Non-agriculture, electives	15 hours
English 20	4 hours
Science, elective	5 hours
Open electives	14 hours

Curriculum in Farm Organization and Management

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
<i>Prescribed Subjects</i>	Hours ¹	<i>Prescribed Subjects</i>	Hours ¹
Ag. Ext. 4—Country Life Problems.....	1	A. H. 5—Live Stock Judging.....	3
Agron. 25—Farm Crops.....	4	Chem. 2a—Inorganic Chemistry and Qualitative Analysis.....	5
Chem. 1 or 1a—Inorganic Chemistry..	5 or 3	D. H. 3—Elements of Dairy Husbandry...	1
Hort. 1a—Elements of Horticulture.....	2	Hort. 1b—Elements of Horticulture.....	2
Rhet. 1*—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
	—	Mil. 2b—Military Drill.....	1
Total	15-18	Total	17

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
A. H. 8 and 21—Principles of Breeding and Feeding.....	3	Agron. 26—Elementary Farm Mechanics.	3
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See page 12.

¹Semester hours. For definition, see page 85.

In addition to the above courses, the following are also prescribed:

Accountancy 11	3 hours
Economics 2 or 1.....	3 or 5 hours
Economics 16c	3 hours
Economics 22	3 hours
Economics 23	3 hours
Business Law 2.....	3 hours
Elective economics, minimum of.....	6 hours
Farm Management 1.....	3 hours
English 20	4 hours
Philosophy 1	3 hours
Elective science, minimum of.....	15 hours
Elective agriculture, minimum of.....	28 hours
Open electives	11 or 9 hours

Total prescribed130 hours

To avoid conflicts with other prescribed work it is suggested that the courses in economics, accountancy, and farm management be taken in the following order:

SECOND YEAR

Business Law 2.....	3	Economics 2.....	3
		Economics 22.....	2

THIRD YEAR

Accountancy 11.....	3	Economics 14.....	2
		Economics 16c.....	3
		Farm Management 1.....	3

FOURTH YEAR

Economics 15.....	2	Business Law 2.....	3
		Economics 17.....	2

Curriculum in Floriculture

(Required for the degree of B. S. in Floriculture)

The object of this curriculum is to fit men and women for the profession of floriculture. The laboratory exercises in the technical subjects consist of practical work in the greenhouses and gardens and give the students a working knowledge of the best methods now in use.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

Hours¹

Chem. 1 or 1a—Inorganic Chemistry..	5 or 3
Ent. 4—Economic Entomology.....	3
Hort. 4—Plant Houses.....	4
Rhet. 1—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hy-	
giene	1
Mil. 2a—Military Drill.....	1

Total15 or 17

SECOND SEMESTER

Prescribed Subjects

Hours¹

Chem. 2a—Inorganic Chemistry and Quali-	
tative Analysis.....	5
Hort. 5—Plant Propagation.....	5
Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 2—Gymnasium.....	1
Mil. 1—Drill Regulations.....	1
Mil. 2b—Military Drill.....	1

Total16

SECOND YEAR

Bot. 1—General Botany.....	5	Agron. 9—Soil Physics.....	5
Eng. 20—Chief English Writers.....	4	Hort. 15a—Principles of Plant Growing..	5
Mil. 2c—Military Drill.....	1	Mil. 2d—Military Drill.....	1

Total10

Total11

¹Semester hours. For definition, see page 85.

THIRD YEAR

Bot. 7a—Plant Pathology.....	5	Bot. 3b—Plant Physiology.....	5
Econ. 2—Principles of Economics.....	3	Hort. 7—Spraying.....	3
Hort. 15b—Commercial Crops.....	5	Hort. 24a—Trees and Shrubs.....	3
Total	13	Total	11

FOURTH YEAR

Hort. 31—Garden Flowers.....	3	Hort. 30—Decorative Plants.....	5
Hort. 24b—Trees and Shrubs.....	3	Hort. 42—Landscape Design.....	3
Total	6	Hort. 32—Floral Decoration.....	4
		Total	12

Suggested Electives

Accountancy	
Chem. 13a—Elementary Qualitative Analysis	5
Economics	
Hort. 28—Exotics.....	1

Suggested Electives

Agron. 12—Soil Fertility.....	5
A. H. 30—Genetics.....	5
Bot. 3a—Plant Anatomy.....	5
Bot. 4a—Taxonomy of Cormophytes.....	5
Botany 7b—Methods of Study of Fungi...	5

Curriculum in Landscape Gardening

(Required for the degree of B. S. in Landscape Gardening)

A four years' course in preparation for professional practise of landscape gardening. Courses are open to any student in the University having the prerequisites or their equivalents.

FIRST YEAR

FIRST SEMESTER

Prescribed Subjects

	Hours ¹
Arch. 31—Drawing.....	4
Bot. 1—Introductory Course.....	5
Hort. 10a—Rural Improvement.....	2
Math. 4—Trigonometry.....	2
Rhet. 1—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene	1
Mil. 2a—Military Drill.....	1
Total	18

SECOND SEMESTER

Prescribed Subjects

	Hours ¹
Arch. 32—Architectural Drawing.....	4
Hort. 5—Plant Propagation.....	5
Hort. 10b—Town Improvement.....	2
Rhet. 2—Rhetoric and Themes.....	3
Mil. 1—Drill Regulations.....	1
Mil. 2b—Military Drill.....	1
Phys. Tr. 2—Gymnasium.....	1
Total	17

SECOND YEAR

Prescribed Subjects

Bot. 4d—Taxonomy.....	3
C. E. 31—Surveying.....	3
Hort. 21a—Landscape Design.....	4
Hort. 31—Garden Flowers.....	3
Mil. 2c—Military Drill.....	1
Total	14

Electives

A. and D. 12—Theory and Practise.....	2
Arch. 13—History of Architecture.....	2

Prescribed Subjects

C. E. 32—Surveying.....	3
Hort. 21b—Landscape Design.....	4
Hort. 24a—Trees and Shrubs.....	3
Mil. 2d—Military Drill.....	1
Total	11

Electives

Arch. 14—History of Architecture.....	2
Ent. 4b—Introductory Economic Entomology	3
Geol. 12—Geology of Soils.....	5
Hort. 2—Small Fruits.....	2
Zool. 16—Field Ornithology.....	3

¹Semester hours. For definition, see page 85.

THIRD YEAR

Prescribed Subjects

Hort. 23a—Landscape Design.....	4
Hort. 24b—Trees and Shrubs.....	3
Hort. 27a—Landscape Construction.....	3

 Total10
Electives

Arch. 15—History of Architecture.....	2
A. and D. 13—History and Practise.....	2
Econ. 2—Principles of Economics.....	2
Hort. 8—Fruit Culture.....	5
Hort. 29a—Garden Design.....	3
Pol. Sci. 1—American Government.....	3
Sociol. 1—Principles of Sociology.....	3

Prescribed Subjects

Hort. 23b—Landscape Design.....	4
Hort. 26a—Planting Design.....	3
Hort. 27b—Landscape Construction.....	3
Hort. 36—Landscape Reading.....	2
Hort. 41—Civic Design (Elementary Course)	1

 Total13
Electives

Arch. 16—History of Architecture.....	2
A. and D. 8—Modeling.....	2
Bot. 20—Plant Diseases.....	3
Hort. 7—Spraying.....	3
Hort. 9—Forestry.....	2
Hort. 29b—Garden Design.....	3
Rhet. 17—Advanced Composition.....	3
Sociol. 7—The Rural Community.....	2

FOURTH YEAR

Prescribed Subjects

C. E. 55—Roads and Pavements.....	2
Hort. 25a—Landscape Design.....	5
Hort. 26b—Planting Design.....	3
Hort. 37a—Civic Design.....	3

 Total13
Electives

A. and D. 4—Water Color.....	2
Hort. 40a—Trees and Shrubs (Advanced Course)	3
Pol. Sci. 4—Municipal Government.....	3
Sociol. 10—Population.....	3

Prescribed Subjects

Hort. 25b—Landscape Design.....	5
Hort. 28—Exotics.....	1
Hort. 37b—Civic Design.....	3
Hort. 38—Office Practise.....	2

 Total11
Electives

Hort. 15—Plant Growing.....	3
Hort. 40b—Trees and Shrubs (Advanced Course)	3

General Electives

Hort. 19—Amateur Floriculture.....	3
*Hort. 39—Special Lectures.....	1-8
Zool. 1—General Zoology.....	2
Chem. 1 or 1a—Inorganic Chemistry..	5 or 3
Modern Language.....	8
Physics.....	10

Curriculum for Prospective Teachers of Agriculture

A curriculum is offered for prospective teachers of agriculture. Among the subjects recommended are the following:

Agronomy 2, 9, 12, 25, 26; Animal Husbandry 1a, 2a, 4a, 5, 6, 11a, 11b, 30†; Dairy Husbandry 2, 3; Horticulture 1a, 1b, 3, 5, 10a, 19; Agricultural Extension, 1, 4-5; Botany 1, 3b; Chemistry 1, 2a, 13a; Entomology 4a-4b; Zoology 1; English 20; Rhetoric 1-2, 19; Public Speaking 5-6; Economics 2; Education 1, 6; Library Science 12; Military 1, 2a-2b, 2c-2d; Physical Training, 1-2, 1a; foreign language.

Curriculum in Household Science

Of the 130 hours required for graduation, 90 are provided for in the prescribed list and the restricted electives of List A. The other 40 hours of credit necessary for graduation may be taken, subject to the approval of the Dean of the College, from any courses offered in the University. Holders of scholar-

*Students taking the professional course are required to register in Horticulture 39 each semester.

†Students taking the Teachers' Curriculum may take Animal Husbandry 80 for one-half semester and receive 2½ credits therefor.

ships in household science in this College take the course as laid out here. Variations from it can be made only by special permission of the Council of Administration on recommendation of the faculty of the College.

PREScribed SUBJECTS

Required for Degree of Bachelor of Science in Household Science

Art and Design 1, 12, 19, 20.....	9 hours
Bacteriology 5	5 hours
Botany 1 or Zoology 1.....	5 hours
Chemistry 1 or 1a, 2a.....	8 or 10 hours
Economics 2	3 hours
English 1, 2.....	8 hours
Household Science 1, 2, 3, 5, 6, 7, 12, 13, 19.....	23 hours
History 1a-1b, or 3a-3b.....	6 or 8 hours
Physiology 4a or 4b.....	5 hours
Physical Training 7a-7b, 9.....	3 hours
Rhetoric 1, 2.....	6 hours
English or Rhetoric.....	5 hours
*List A, a minimum of.....	4 hours

Total required subjects.....90 to 94 hours

Electives

40 to 36 hours

Total130 hours

ELECTIVES

List A—English 21, 22, 23, 24

Horticulture 1a, 1b, 2, 3, 5, 19, 28, 10a

Household Science 11, 14, 17, 18

Economics 22, 26

Sociology 1

Physics 7a, 8a

Education 1, 6, 10

Agronomy 7, 9, 12, 25, 26

Animal Husbandry 10, 5

Dairy Husbandry 1, 3, 4, 11, 13

Agricultural Extension 1, 3, 4

Suggested Curriculum

FIRST YEAR

FIRST SEMESTER

SECOND SEMESTER

	Hours ¹		Hours ¹
A. & D. 1—Freehand Drawing.....	3	Chem. 2a—Inorg. Chem. and Qual. Anal..	5
² Chem. 1 or 1a—Inorganic Chemistry.....	5 or 3	³ H. Sci. 1—Sel. and Prep. of Food.....	3
H. Sci. 2—Home Arch. and Sanitation....	2	H. Sci. 7—Textiles.....	2
Phys. Tr. 7—Gymnasium Practise.....	1	Lib'y 12—General Reference.....	2
Phys. Tr. 9—Hygiene.....	1	Phys. Tr. 7—Gymnasium.....	1
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Total	13	Total	16

*If physics has not been offered for entrance, its equivalent should be elected.

¹Semester hours. For definition, see page 85.

²If Chemistry 1a is taken, a 2-hour elective must be added, with the approval of the adviser.

³Attention is called to the fact that high school physics is a prerequisite for Household Science 1.

SECOND YEAR

Bot. or Zool. 1—Introductory Course.....	5	A. & D. 12—Applied Design.....	2
Econ. 26—Economic Resources.....	3	Econ. 22—Econ. Hist. of U. S.....	3
Eng. 1—Survey of Eng. Lit.....	4	Eng. 2—Survey of Eng. Lit.....	4
H. Sci. 6—Econ. Uses of Food.....	3	Physiol. 4—Minor Course.....	5
Hort. 19—Amateur Floriculture.....	3		
<hr/>		<hr/>	
Total	18	Total	14

THIRD YEAR

A. & D. 19—History of Fine Arts.....	2	A. & D. 20—History of Fine Arts.....	2
Eng. 23—Intro. to Shakespeare.....	3	Bact. 5—Intro. Bacteriology.....	5
Hist. 1a or Hist. 3a.....	4 or 3	Econ. 2—Principles of Econ.....	3
H. Sci. 5—Dietetics.....	3	Hist. 1b—Continental European History, or	
H. Sci. 19—Dress Design.....	3	Hist. 3b—History of the U. S.....	4 or 3
		H. Sci. 3—Home Decoration.....	2
		H. Sci. 12—Clothing	2
<hr/>		<hr/>	
Total	15 or 14	Total	18 or 17

FOURTH YEAR

Edu. 1—Intro. to Education.....	4	Edu. 10—Technics of Teaching.....	3
H. Sci. 13—Hist. of Home Economics....	3	H. Sci. 10—Home Management.....	3
Sociol. 1—Principles of Soc.....	3	H. Sci. 11—Teachers' Course.....	3
		H. Sci. 17—Study of Textiles.....	3
<hr/>		<hr/>	
Total	9	Total	11

THE SCHOOL OF MUSIC

Music students should read the General Directions for Registration given in paragraphs 1-29 on pages 9-15. Having secured their study-lists (see paragraphs 1-6), they should report to their advisers in Room 202, University Hall.

Each student should follow, *point by point*, the directions given on the first coupon of his or her study-list.

Each student must report to the Chapel, 218 University Hall, to secure approval of sections chosen in sectional courses (other than courses in music), and to make out class cards and pay the fees.

Practise pianos in the Woman's Building or in University Hall, for men, may be secured at the rate of \$3 a semester for one hour a day. A two-manual and pedal practise organ is installed in University Hall for the use of organ students at a reasonable fee.

CHORAL or ORCHESTRA work is *required* of all students who are taking courses in Applied Music.

All music students are required to attend the concerts and recitals which are given under the auspices of the School of Music.

Public performance being part of the course of study in a practical subject, all students are required to participate in a program when sufficiently prepared.

Students, who by reason of deficient musical ability, inattention, or other valid reason, fail to make satisfactory progress, may be dropped from the classes.

REQUIREMENTS FOR GRADUATION

Candidates for the degree of Bachelor of Music must offer credit for 130 semester hours, including the prescribed subjects named below, together with an acceptable thesis on a topic related to music.

Curriculum in Music

FIRST SEMESTER		FIRST YEAR		SECOND SEMESTER	
	Hours ¹		Hours ¹		Hours ¹
Music 3—Harmony.....	2	Music 4—Harmony.....	2	Music 42b, 52b, 62b or 82—Piano, Voice, Violin or Organ (Major Subject).....	4
Music 42a, 52a, 62a or 81—Piano, Voice, Violin or Organ (Major Subject).....	4	Music 46b, 56b, 66b or 83b—Piano, Voice, Violin or Organ (Minor Subject).....	2	Music 21b—Ear Training.....	2
Music 46a, 56a, 66a or 83a—Piano, Voice, Violin or Organ (Minor Subject).....	2	Music 21a—Ear Training.....	2	Rhet. 2—Rhetoric and Themes.....	3
Music 21a—Ear Training.....	2	*Rhet. 1—Rhetoric and Themes.....	3	Foreign Language—French, German, or Italian	4
*Rhet. 1—Rhetoric and Themes.....	3	Foreign Language—French, German, or Italian	4	Phys. Tr. 7a—Gymnasium (women).....	1
Foreign Language—French, German, or Italian	4	Phys. Tr. 9—Hygiene (women).....	1	Phys. Tr. 2—Gymnasium (men).....	1
Phys. Tr. 7a—Gymnasium (women).....	1	Phys. Tr. 1—Gymnasium (men).....	1	Mil. 2b—Drill (men).....	1
Phys. Tr. 9—Hygiene (women).....	1	Phys. Tr. 1a—Hygiene (men).....	1	Mil. 1—Drill Regulations (men).....	1
Phys. Tr. 1—Gymnasium (men).....	1	Mil. 2a—Drill (men).....	1		
Phys. Tr. 1a—Hygiene (men).....	1				
Mil. 2a—Drill (men).....	1				
Total, Men.....	17	Total, Men.....	18		
Total, Women.....	17	Total, Women.....	16		

*Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See page 12.

¹Semester hours. For definition, see page 85.

SECOND YEAR

Music 1—History of Music.....	2	Music 2—History of Music.....	2
Music 5—Advanced Harmony.....	3	Music 6—Advanced Harmony.....	3
Music 43a, 53a, 63a or 84—Piano, Voice, Violin or Organ (Major Subject).....	4	Music 43b, 53b, 63b or 85—Piano, Voice, Violin or Organ (Major Subject).....	4
Music 46c, 56c, 66c or 83c—Piano, Voice, Violin or Organ (Minor Subject).....	2	Music 46d, 56d, 66d or 83d—Piano, Voice, Violin or Organ (Minor Subject).....	2
Music 22a—Ear Training.....	1	Music 22b—Ear Training.....	1
Music 23a—Sight Singing.....	1	Music 23b—Sight Singing.....	1
Foreign Language—French, German or Italian	4	Foreign Language—French, German or Italian	4
Mil. 2c—Drill (men).....	1	Mil. 2d—Drill (men).....	1
<i>Total, Men</i>	17	<i>Total, Men</i>	17
<i>Total, Women</i>	16	<i>Total, Women</i>	16

THIRD YEAR

Music 7—Counterpoint, Canon and Fugue. 3		Music 8—Counterpoint, Canon and Fugue. 3	
Music 44a, 54a, 64a or 86—Piano, Voice, Violin or Organ (Major Subject).....	4	Music 44b, 54b, 64b or 87—Piano, Voice, Violin or Organ (Major Subject).....	4
Music 46e, 56e, 66e—Minor Subject.....	2	Music 24b—Sight Singing.....	1
Music 24a—Sight Singing.....	1	English 2—Survey of English Literature..	4
Education 1—Principles.....	4	Music 46f, 56f, 66f—Minor Subject.....	2
English 1—Survey of English Literature..	4		
<i>Total</i>	18	<i>Total</i>	16

FOURTH YEAR

Music 9—General Theory, Free Composition 2		Education 10—Technics of Teaching.....	3
Music 11—Acoustics.....	1	Music 10—General Theory, Free Composi- tion	2
Music 45a, 55a, 65a or 88—Piano, Voice, Violin or Organ (Major Subject).....	4	Music 45b, 55b, 65b or 89—Piano, Voice, Violin or Organ (Major Subject).....	4
Music 46g, 56g, 66g—Minor Subject.....	2	Music 46h, 56h, 66h—Minor Subject.....	2
Music 94a—Recital.....	1	Music 94b—Recital.....	1
English 23—Introduction to Shakespeare..	3	Music 12—Acoustics	1
Music 27a—Ensemble.....	1	Music 27b—Ensemble	1
<i>Total</i>	14	<i>Total</i>	16

NOTE.—Students majoring in PUBLIC SCHOOL MUSIC METHODS will in the Fourth Year substitute Music 25a-25b (4) each semester for the practical major, in which case Voice (Music 46a-46b) will be required as the practical minor.

In addition, for Women: Electives, to make up the prescribed total of 130 hours. These extra credits may be taken at any time; the election made must be approved by the student's adviser.

Courses 41a-41b to 88, 89 include regular attendance in Orchestra or Choral Society unless a student is excused by the Director of the School of Music.

COLLEGE OF MEDICINE (URBANA)

ONE-YEAR MEDICAL COLLEGE CURRICULUM AT URBANA

This curriculum is open to students who have completed the two years prescribed pre-medical curriculum at Urbana, as described on page 29, or its equivalent.

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Bact. 1—Introductory Bacteriology.....	3	Bact. 20—Pathological Bacteriology.....	3
Chem. 15—Physiological Chemistry.....	5	Chem. 15a—Metabolism.....	2
Physiol. 1—Histology.....	3	Physiol. 2—Experimental Physiology.....	5
Physiol. 4—General Physiology.....	5	Physiol. 8—Histology.....	5
Human Anatomy ¹ 1—Introduction.....	3	Human Anatomy 2—Introduction.....	3
Total	19	Total	18

A student who completes this one-year curriculum in addition to the two years pre-medical curriculum (page 28), may receive credit by transfer for one year of work in the College of Medicine of the University of Illinois at Chicago, and upon completion of the second year of work in that College may receive the degree of Bachelor of Science on the recommendation of the faculty of the College of Liberal Arts and Sciences of the University of Illinois. By this combined arts-medical curriculum the student may receive the degrees of Bachelor of Science and Doctor of Medicine with six years of work.

By making this one-year medical college curriculum the fourth year in the College of Liberal Arts and Sciences, including in the three preceding years the courses in the pre-medical curriculum described on page 28, and shaping his curriculum with the approval of the Dean of that College, a student may receive the degree of Bachelor of Arts at the end of four years. He may thus secure with seven years of work the degrees of Bachelor of Arts and Doctor of Medicine.

¹Semester hours. For definition, see page 85.

THE COLLEGE OF LAW

Law students should read the General Directions given in paragraphs 1-29 on pages 9-15. Having secured their study-lists (see paragraphs 1-6, pages 9, 10), they should report to their advisers in Room 206, Law Building.

Each student should follow, *point by point*, the directions given on the first coupon of his study-list.

REQUIREMENTS FOR GRADUATION AND DEGREES

The degree of Bachelor of Laws will be granted to all regularly matriculated students who complete all the courses in the first-year list, course 12 in the second year, and enough of the other courses offered to make 84 hours of credit.

Degree of Doctor of Law

The degree of Doctor of Law (J.D.) will be granted to students who comply with the following conditions:

1. Complete the work required for the degree of Bachelor of Laws.
2. Secure a bachelor's degree in arts or science at least two academic years prior to the completion of the course for the degree of Bachelor of Laws.
3. Obtain a minimum average grade of 85 in the College of Law.
4. Present a thesis approved by the faculty of the College of Law, in accordance with the requirement hereinafter set out.

Rules Concerning Theses

The rules concerning theses presented for the degree of Doctor of Law are as follows: 1. The thesis must be on a subject approved by the Dean of the College of Law after consultation with him as to the proposed method of treatment. 2. The subject of the thesis must be filed with the Secretary on or before December 20. 3. The thesis must be typewritten on paper $8\frac{1}{2} \times 11$ inches, with a margin of at least one inch at the top, bottom, and sides. 4. It should contain not less than 4,000 nor more than 10,000 words. 5. In citing cases, names of parties, volume, page, and year should be given. Citations are not to be counted in determining the number of words. The student is expected to exhaust the cases decided during the period covered by his thesis, and to state the period for which the cases have been examined. 6. The thesis must be delivered to the Secretary of the faculty not later than May 1.

The thesis may then be returned to the writer for revision, or, if unsatisfactory, it may be rejected altogether. If returned for revision, it may be rejected after being revised. If accepted, it will be filed in the Law Library, and may be published by the College of Law or by the University.

Curriculum Leading to the Degree of LL. B.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Law 1a—Contracts	3	Law 1b—Contracts	3
Law 2a—Torts	3	Law 2b—Torts	3
Law 5—Criminal Law.....	4	Law 3—Real Property.....	3
Law 6—Personal Property.....	2	Law 7—Domestic Relations.....	2

NOTE.—For second-year and third-year curriculums, see the special College of Law program, September, 1916.

Suggested Preparatory Curriculum

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Foreign language.....	4	Foreign Language.....	4
Hist. 2a—English History.....	3	Hist. 2b—English History.....	3
Mathematics or Science.....	5	Math. 2—Trigonometry.....	3
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 1—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	1	Mil. 1—Drill Regulations.....	1
	—	Mil. 2b—Military Drill.....	1
Total	17	Total	16

SECOND YEAR

Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Hist. 3a—History of the U. S.....	3	Eng. 20—Chief English Writers.....	4
Mathematics or Science or Foreign Languages	5 or 4	Hist. 3b—History of the U. S.....	3
Pol. Sci. 1—American Government.....	3	Philos. 1—Logic.....	3
Mil. 2c—Military Drill.....	1	Pol. Sci. 3—State and Local Government..	3
	—	Mil. 2d—Military Drill.....	1
Total	17 or 16	Total	17

The courses in military and physical training, Rhetoric 1-2, and eight hours in foreign language are required of freshmen in the College of Liberal Arts and Sciences. Latin is strongly urged for all students intending to study Law; but those who have not had the necessary preparation for college courses in Latin should substitute a modern language, preferably French or German.

SCHOLARSHIP PRIZES

Eight scholarship prizes are open to matriculated students of the first and second years, to be awarded at the end of each year, four of \$50 each and four of \$25 each, available in discharge of tuition fees.

The American Law Book Company of New York offers an annual prize consisting of the *Cyclopedia of Law and Procedure* ("CYC"), to be awarded to the member of the senior class making the best average during his senior year.

Callaghan & Company, law publishers, of Chicago, offer an annual prize consisting of the *Cyclopedic Law Dictionary* to be awarded to the member of the second-year class making the best average during his second year.

¹Semester hours. For definition, see page 85.

COMBINED SIX-YEAR CURRICULUM IN LIBERAL ARTS AND SCIENCES AND LAW

A student who has senior standing in the College of Liberal Arts and Sciences may take the first-year courses in law and obtain 30 hours credit toward the degree of Bachelor of Arts and 28 hours toward the degree of Bachelor of Laws.* Students registered in the College of Law may also count 6 hours toward both degrees for six hours of work offered by the College of Liberal Arts and Sciences in jurisprudence, international law, and administrative law.

*If the student takes or successfully carries less than the full first year of law work, it will be counted only hour for hour toward the A.B. degree.

THE LIBRARY SCHOOL

Library students should present themselves in Room 320, Library Building, where both their admission and their registration may be completed.

CURRICULUM IN LIBRARY SCIENCE

The curriculum is two years in length. For graduation a student must receive credit for all courses except those marked with an asterisk (*), which are elective. The degree of Bachelor of Library Science is conferred on a student who has completed the required work in the two years' curriculum, and has received credit in courses amounting to 65 hours.

JUNIOR YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Lib. Sc. 2a—Reference Work.....	3	Lib. Sc. 2b—Reference Work.....	3
Lib. Sc. 3a—Selection of Books.....	1	Lib. Sc. 3a—Selection of Books.....	2
Lib. Sc. 4a—Practise Work.....	2	Lib. Sc. 4b—Practise Work.....	2
Lib. Sc. 16—Order and Accession.....	2	Lib. Sc. 7—History of Libraries.....	2
Lib. Sc. 17—Classification	3	Lib. Sc. 19—Trade Bibliography.....	1
Lib. Sc. 18—Cataloging	3	Lib. Sc. 20—Loan Department.....	1
Lib. Sc. 23a—Library Administration.....	1	Lib. Sc. 21—Printing, Binding, Indexing..	2
		Lib. Sc. 22—Library Extension.....	3
		Lib. Sc. 23a—Library Administration.....	1
Total	16	Total	17

SENIOR YEAR

Lib. Sc. 6a—Subject Bibliography.....	2	Lib. Sc. 6b—Subject Bibliography.....	2
*Lib. Sc. 8—Advanced Reference Work...	2	Lib. Sc. 9—History of Books.....	2
Lib. Sc. 10a—Practise Work.....	4	Lib. Sc. 10b—Practise Work.....	4
Lib. Sc. 13a—Public Documents.....	2	*Lib. Sc. 13b—Public Documents.....	2
Lib. Sc. 15a—Seminar	2	Lib. Sc. 15b—Seminar	2
Lib. Sc. 24a—Selection of Books.....	2	Lib. Sc. 24b—Selection of Books.....	2
Lib. Sc. 26a—Library Administration.....	3	*Lib. Sc. 25—Advanced Classification.....	1
*Lib. Sc. 27—Bibliographical Institutions..	1	Lib. Sc. 26b—Library Administration.....	3
		*Lib. Sc. 28—Practise Work.....	1 to 4
Total	18	Total	19 to 22

Proposed Preliminary Curriculum

Undergraduates who intend, on the completion of their college work, to apply for admission to the Library School, are requested to select their courses so as to conform in general to the following recommended program of studies preparatory to library work:

English literature, 5*; rhetoric, 2.

Latin, 4, in addition to four years of high school Latin.

German, 6, in addition to two years of high school German.

French, 4, in addition to two years of high school French.

¹Semester hours. For definition, see page 85.

Languages begun in college instead of in the high school should be continued for a longer period.

Medieval and modern European history, 3; history of England, 3; history of the United States, 3.

Economics, 3; political science, 2; sociology, 3.

Philosophy, 2; general psychology, 2.

Zoology, 3; botany, 2; chemistry or physics, 3.

The total of this work is 100 semester hours, leaving the equivalent of one year of a four-year course free for work in other subjects or for more work in the subjects named.

PREPARATION FOR SPECIAL LIBRARIES

Seniors who desire to prepare themselves for work in special libraries (e. g. normal school, historical, business, agricultural) may, with the approval of the faculty, substitute certain advanced courses in other colleges and schools of the University for certain Library School courses.

LIBRARY VISITS AND FIELD WORK

Each year all the students in the Library School are required to visit the libraries and certain of the book binderies, book stores, and printing establishments of either Chicago and vicinity or St. Louis and vicinity. During this visit, which occupies one week, the students are accompanied by a member of the faculty. The expense of this week is about \$20.00.

In order to assure a varied library experience, each student in the senior year is required to spend one month in an assigned library, working, as far as practicable, under the same conditions as a member of the staff of that library. The expense of this month is about \$40.00.

THE SCHOOL OF EDUCATION

GENERAL STATEMENT

The School of Education was established in 1905 as an organization of the various activities of the University which are concerned with the professional preparation of teachers and supervisors for the public schools. The nucleus of the School is the department of education in the College of Liberal Arts and Sciences. The faculty of the School is made up of the members of this department and of other departments who offer courses intended for the preparation of high-school teachers. The Board of Trustees has approved plans for a building to be used as a laboratory for the School of Education and to include quarters for a training school of secondary grade, and has purchased a site upon which the first wing of this building will be erected.

COMMITTEE ON APPOINTMENT OF TEACHERS

The Committee on Appointment of Teachers recommends qualified graduates of the University for positions as teachers or supervisors in public schools, colleges, and technical schools in response to requests from the school authorities. The Director of the School of Education is chairman of the Committee, and the Secretary of the School is its chief executive officer.

The recommendations of the Committee are made under the following regulations, which were adopted by the University Senate on June 3, 1912:

1. The University Committee on Appointments is authorized to issue its recommendation, signed by the committee as the agent of the University, in all cases in which it is satisfied with the student's scholarship and ability to teach. The Committee shall regard the scholarship requirements as met if, in addition to carrying the professional courses mentioned in the next paragraph, the student has passed with an average grade of 85 the courses necessary to constitute a major in the principal subject which he wishes to teach, and courses aggregating a minimum varying from six to twelve semester hours (according to subject, and at the discretion of the Committee) in each of the other subjects for which he wishes to be recommended. The Committee shall, however, in each case secure the written opinion of the department concerned in regard to the scholarship of the applicant, and shall view the evidence of scholarship as shown by the records in the light of this opinion; and if there appear to the Committee to be reasons which from their nature cannot be shown by mere records for questioning the scholastic ability of the student, the Committee may in its discretion withhold the recommendation.

2. A candidate must have successfully completed the following courses in the department of education:

- a. An introductory course which shall aim (1) to acquaint the prospective teacher with the public-school system as it exists today in the United States, and (2) to present a brief outline of the principles of education. (A four-hour course.)

- b. A course in the technique of teaching, accompanied by observation of classroom work in secondary schools, and including a discussion of class management (routine and discipline), the elements of school hygiene, and the types of school exercises. (A three-hour course.)

3. The Director of the School of Education may, in his discretion, excuse a candidate from the professional courses outlined above, (1) if the candidate is a normal-school graduate or has taken equivalent courses in a normal school or in another college or university; or (2) if the candidate has had at least one year of successful teaching experience. If, at the time of registration with the Committee on Appointments, the candidate has not completed one of the required courses, but is enrolled at that time in the course, a Committee recommendation may be given with the approval of the instructor in charge of the course.

The courses mentioned in Section 2 are (a) Education 1, Introduction to Education (4 hours), and (b) Education 10, Observation and Technique of Teaching (3 hours). Either course may be taken in either semester.

CERTIFICATION OF HIGH-SCHOOL TEACHERS IN ILLINOIS

A student who expects to teach in the Illinois high schools should bear in mind that all teachers must be duly certificated. County high-school certificates are granted upon examination by county superintendents, and State high-school certificates upon examination by the State Superintendent. For county high-school certificates *issued without an examination* the new certificating law makes the following provision:

"At the option of the county superintendent, a high-school certificate may be issued without examination to graduates of a recognized normal school, college, or university, who present, within three years after graduation, certified credits in English, pedagogy, and six high school subjects (chosen from a list published by the Examining Board) and accompanied by faculty recommendation of ability to teach in the high school." (Section 6.)

The educational courses required for the official recommendation of the University, Education 1 and 10, are commonly accepted as meeting the requirement in pedagogy, and the recommendation of the Committee on Appointment of Teachers satisfies the legal requirement of "faculty recommendation of ability to teach in the high school."

THE SCHOOL OF RAILWAY ENGINEERING AND ADMINISTRATION

GENERAL STATEMENT

The School of Railway Engineering and Administration has been established to prepare men for the technical and administrative departments of railroads. The work offered is arranged in five different curriculums, any one of which is designed to occupy four years' time. The curriculums are:

- Railway Civil Engineering
- Railway Mechanical Engineering
- Railway Electrical Engineering
- Railway Transportation
- Railway Administration

The first three of these curriculums are administered by the College of Engineering, and a description of them appears with that of other curriculums offered by this College. Students are admitted to them under the same conditions as to other curriculums of the College of Engineering, and they have available for their use all of the library, drafting-room, and laboratory facilities which constitute the equipment of this College. The last two curriculums are administered by the College of Commerce and Business Administration; they are described in detail in connection with the other curriculums of this College. Students are admitted to them under the same conditions as to other curriculums of the College of Commerce and Business Administration.

It is the purpose of each of these curriculums to add to a foundation of general discipline and training specialized training for those who look forward to careers in railway service.

THE GRADUATE SCHOOL

ADMISSION

Admission to the Graduate School may be granted to graduates of institutions whose requirements for the bachelor's degree are substantially equivalent to those of the University of Illinois, and to applicants from other institutions approved by the executive faculty, as hereinafter provided. *Admission to the Graduate School does not, however, imply admission to candidacy for an advanced degree.*

A graduate of an institution meeting the requirements of a standard college may be admitted to the Graduate School, provided he satisfies the Dean and the departments concerned that he will be able to proceed to the master's degree in a period not exceeding two years.

Unless otherwise specially permitted, a student enrolled in the Graduate School must take each semester at least one course accepted by the executive faculty for credit in his major subject.

Admission to particular graduate courses or departments may be granted only to those who have had the requisite undergraduate work in those courses or departments. But a student of mature age who satisfies the Dean and the department concerned of his ability to pursue graduate work in a given line may be enrolled in particular graduate courses, and permitted to carry on such study or investigation under the direction of a department of the University as the department shall recommend and the executive faculty approve.

Application blanks for admission to the Graduate School may be secured from the Registrar, Room 156, Administration Building.

REGISTRATION AND PROGRAM OF STUDY

In case the student's application for admission is approved, he receives from the Registrar a permit to register and also a study-list blank. This study-list must be filled out with the advice of the professors in charge of the selected work.

Advisers

The person in charge of the major work of the student becomes his adviser, and, with those with whom the student is taking first and second minor courses, forms a committee with general supervision over the student's course of study. The committee is expected to follow the student's work and to see that he is helped to lay out an intelligently planned curriculum, and to give him such advice as may be necessary concerning his scholastic career.

Amount of Work

Each student is required to attend a minimum of four class, lecture, or laboratory exercises a week, in the first year of his graduate study; in no case is he permitted during his course to attend more than twelve a week.

Each first year student doing full work must take at least four unit courses. A unit course is one which requires ten hours of time a week through one semester, irrespective of the mode of distribution of that time in class work, laboratory

work, and private study. Four such courses or their equivalent constitute a full minimum program for one semester, and eight such courses, or their equivalent of graduate grade, constitute the minimum year's work required for a master's degree.

Therefore, registration for full work for the master's degree ordinarily provides for three unit courses, or their equivalent, a semester, in addition to a thesis, the time devoted to the thesis being ordinarily reckoned as equivalent to that for one unit course, or ten hours of time a week. If a student is excused from writing a thesis, he must take four unit courses, or their equivalent, each semester.

Unless otherwise specified by the department concerned, a course for graduates and advanced undergraduates, not open to students below senior grade and counting four or five hours of undergraduate credit, if taken by graduate students, will be treated as a unit course; when counting less than four hours of undergraduate credit, such a course, if taken by graduate students, will be treated as a half-unit course.

Unless otherwise specified by the department, a course the prerequisites of which are such as to make it possible for juniors or sophomores to be admitted, if taken by a graduate student, is counted as a half-unit course, or a quarter-unit course, according to the number of hours of undergraduate credit for which the course is given.

Miscellaneous and Listener's Courses

Graduate students are permitted under proper circumstances to attend classes as visitors, or listeners, and to elect miscellaneous subjects, that is, courses which do not count towards an advanced degree. Under the authority conferred by the faculty on the Dean no student will be permitted by the Dean to visit more than one class or to take more than one miscellaneous subject, nor is any subject open as a listener's or miscellaneous course unless it has a specific educational bearing on the student's major or minor subjects of study.

The above regulations concerning the program of studies are laid out primarily for first-year students. Second-year and third-year graduate students fill out their programs irrespective of unit values of courses, according to their needs, under the advice of their instructors.

Students on the Staff

Assistants and others on the University staff who undertake to do graduate work are permitted to take an amount of work determined by the terms of their employment. Such a student, an applicant for a master's degree, must ordinarily stay through at least two years. In no case will the doctor's degree be conferred upon an applicant otherwise fit in less than four years if he is on the staff in any capacity.

Residence and Transfer of Credit

Continuous residence and study are required of all members of the Graduate School, unless they are granted leave of absence by the Dean, on recommendation of the professors in charge of their work, for the purpose of carrying on elsewhere studies or investigation in the line of work for their degrees.

Students should note, moreover, that all the work for the master's degree must be done in residence at the University, except in the case of members of the staff who have spent half of their time in study through a year at some other institution, and then do the rest of the work required during a year's

residence here. Credit for work done elsewhere is not "transferred." The candidate is examined here on all the work required for the degree.

For all other details of the organization, method of work, and requirements for advanced degrees in the Graduate School, see the Graduate School circular. For convenience of reference, descriptions of graduate courses are printed also in this volume in connection with the descriptions of the undergraduate courses of each department.

UNIVERSITY HONORS

The University gives public official recognition to such students as attain a high grade of scholarship by the following system of honors.

Preliminary Honors

Preliminary Honors are assigned at the completion of the sophomore year on the basis of the average of the grades received during the freshman and sophomore years in all studies except military and physical training. The number of persons to whom honors are awarded may not exceed one-tenth of the membership of the sophomore class. A failure in any subject disqualifies a student from receiving these honors. Preliminary Honors afford an opportunity for sophomores to secure recognition for high scholarship without waiting for graduation.

Final and Special Honors

(Candidates for the Degrees of B.S., B.Mus., LL.B., and B.L.S.)

Final Honors are assigned on graduation on the basis of the average grades received during the junior and senior years. The number of persons to whom final honors are awarded may not exceed one-tenth of the membership of the senior class. A failure in any subject during the junior and senior years disqualifies a student from receiving these honors. Final honors are designed especially to favor students whose preparatory education has been so imperfect as to prevent them from receiving preliminary honors.

Special Honors are awarded at the close of the senior year. No student may receive such honors who has not completed, before the beginning of his senior year, at least twenty hours' work in the subject, or group of allied subjects, in which the honors are proposed; he must complete thirty hours' work in the same subject, or group of allied subjects, by the end of his senior year, must do such other work as the professor in charge may assign, and must prepare an acceptable thesis. No student is eligible for special honors who, during the senior year, has received a grade of less than eighty in any subject. Special honors are planned for especially brilliant students who prefer to concentrate their efforts upon a special subject or group of subjects. A student may be a recipient of both final and special honors.

The Degree of Bachelor of Arts with Honors

The faculty of the College of Liberal Arts and Sciences have been authorized to recommend candidates for the degree of Bachelor of Arts *with honors* in a particular subject. Candidates for the degree with honors will be recommended by the faculty under the following conditions:

- (1) The student must have completed the work offered for his major with an average of not less than 90.
- (2) He must have completed the work offered for his minor with an average of not less than 85.
- (3) Each candidate is required to present a thesis in his major subject.
- (4) Especially poor or careless work in any other subject may, by vote of the faculty, cause the honor degree to be withheld.

The purpose of these honors is not to encourage premature specialization, but to give special recognition to students who have pursued with success correlated courses of study, and to emphasize the importance, for scholarship in any subject, of thoro training in other related subjects. Candidates should announce their intention as early as possible in their college curriculum and consult freely with the head of the department concerned in regard to the selection of their studies.

Candidates for the degree of Bachelor of Science in the College of Liberal Arts and Sciences are eligible for final and special honors under the regulations stated on the preceding page.

Freshman Honors

(College of Liberal Arts and Sciences)

At the close of each year a list is prepared of those members of the freshman class in the College of Liberal Arts and Sciences who have made an especially good record in scholarship. The names of such students are announced at an assembly of the College; notice is also sent in each case to the parent or guardian, and to the principal of the high school of which the student is a graduate.

List of Honors

The names of the students who receive honors under the foregoing regulations are published in the *Annual Register*.

DESCRIPTION OF COURSES

EXPLANATION

The arrangement of subjects in the following Description of Courses is alphabetical. The connections of allied departments are indicated by cross references.

Following the description of each course of instruction will be found the requirements, if any, for admission to that particular course. The sequence indicated by these prerequisites must be followed. For instance, under Art and Design 7c, Still-life in Oil Colors, the prerequisites given are Art and Design, 1 and 2. These two courses must be completed before Course 7c may be taken.

If a course not required for graduation is selected by fewer than five students it may be withdrawn for the semester.

Graduate courses are numbered upward from 100.

Credit is reckoned in *semester hours*, or simply *hours*. An *hour* is one class period a week for one semester, or the equivalent in laboratory, shop, or drawing room. Graduate work is not recorded in credit hours, nor do the credit hours of undergraduate courses apply to graduate students enrolled in them; see the Graduate School circular for the unit values of graduate courses.

The semester, and the number of hours each semester for which the course counts, are shown after each course, thus: *I, II; (2)*. The Roman figures indicate semesters; the Arabic numerals in parenthesis indicate hours of credit for *each semester* for undergraduates. The omission of a course for the current year is indicated by enclosing the entire description of such a course in brackets.

The various University buildings are designated by the following abbreviations:

Agricultural Building.....	Ag.	Mechanical Engineering Laboratory....	M.L.
Applied Mechanics Laboratory.....	L.A.M.	Men's Gymnasium.....	Gym.
Astronomical Observatory.....	Obs.	Metal Shops.....	M.S.
Ceramics Laboratory.....	Cer.	Mining Engineering Laboratory.....	Min.L.
Chemistry Building.....	Ch.	Natural History Hall.....	N.H.
Commerce Building.....	Com.	Physics Laboratory.....	P.L.
Electrical Engineering Laboratory.....	E.L.	Stock Judging Pavilion.....	S.P.
Engineering Hall.....	E.H.	Transportation Building.....	T.B.
Farm Mechanics Building.....	F.M.	University Hall.....	U.H.
Floricultural Greenhouses.....	F.G.	Vivarium Building.....	V.B.
Horticultural Building.....	H.B.	Vegetable Greenhouse.....	V.G.
Library.....	Lib.	Woman's Building.....	W.B.
Lincoln Hall.....	L.H.	Wood Shops.....	W.S.

ACCOUNTANCY

(See BUSINESS ORGANIZATION AND OPERATION.)

AGRICULTURAL EXTENSION

FRED HENRY RANKIN, B.S., *Superintendent and Assistant to the Dean, with rank of Assistant Professor*

ARETAS WILBUR NOLAN, M.S., *Assistant Professor*

ALBERT WOODWARD JAMISON, M.S., *Assistant Professor*

JOSEPH HARVEY CHECKLEY, B.S., *Assistant*

ROBERT ENOCH HIERONYMUS, M.A., LL.D., *Community Adviser*

JAMES HENRY GREENE, M.S., *State Leader, Junior Extension*

1. Principles and Methods of High School Agriculture.—Adaptation of agricultural science and practise to high school conditions; order and methods of presentation; laboratory work; apparatus; field work. Practise teaching provided through co-operation with the local high school. *II; (5)*.

Prerequisite: Two years' work in agriculture.

Agronomy

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	1	5	—	3	3	3	3	3	—	553 Ag.	Nolan

3. Agricultural Extension Teachings.—The service of extension enterprises to the people; farmers' institutes; agricultural extension schools; farmers' clubs and co-operative work in rural communities. *II*; (1).

Prerequisite: One year of university work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	3	1	—	—	—	3	—	—	—	Morrow Hall	Rankin Jamison

4. Country Life Problems.—Problems of the farm; duties of citizenship; social, economic, and educational work in rural communities. Lectures. Required of first-year students. *I*; (1).

(Credit given to agricultural freshmen only.)

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agricultural Extension	4	1	—	3	—	3	—	—	—	Morrow Hall	Davenport and others

AGRONOMY

CYRIL GEORGE HOPKINS, Ph.D., *Professor, Agronomy.*

LOUIE HENRIE SMITH, Ph.D., *Professor, Plant Breeding*

JEREMIAH GEORGE MOSIER, B.S., *Professor, Soil Physics.*

WILLIAM LEONIDAS BURLISON, Ph.D., *Associate Professor, Crop Production*

ROBERT STEWART, Ph.D., *Associate Professor, Soil Fertility*

AXEL FERDINAND GUSTAFSON, M.S., *Assistant Professor, Soil Physics*

EARL ARCHIBALD WHITE, M.S., *Assistant Professor, Farm Mechanics*

IRA WILMER DICKERSON, B.S., *Associate, Farm Mechanics*

FREDERICK CHARLES BAUER, B.S., *Associate, Soil Fertility*

ALBERT LEMUEL WHITING, Ph.D., *Associate, Soil Biology*

CHESTER OTIS REED, B.S., *Instructor, Farm Mechanics*

FORREST ADDISON FISHER, B.S., *Instructor, Soil Physics*

MARVIN EDWARD JAHR, A.B., *Instructor, Farm Mechanics*

HARRY CHARLES GILKERSON, B.S., *Instructor, Soil Fertility*

HOWARD JOHN SNIDER, B.S., *Instructor, Soil Fertility*

WARREN RIPPEY SCHOONOVER, M.S., *Instructor, Soil Biology*

EDWARD HARVEY WALWORTH, B.S., *Instructor, Crop Production*

FRANK ARCHIBALD WYATT, Ph.D., *Instructor, Soil Fertility*

ALFRED THORPE MORISON, B.S., *Assistant, Crop Production*

WASHINGTON IRVING BROCKSON, M.S., *Assistant, Crop Production*

RAY IRIS SHAWL, B.S., *Assistant, Farm Mechanics*

1. Drainage.—Drainage and its surveying operations. Chaining, mapping, leveling, designing, setting grade stakes, laying tile. Lectures and laboratory first half semester; field work second half semester. *II*; (3).

Prerequisite: Agronomy 9 (Soil Physics), or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	1	3	—	10,11	—	10,11	—	10,11	—	201 F. M.	Jahr

2. Field Machinery.—Construction, principles of operation, adjustment, purchase, and care of implements for soil, seed, and feed preparation, and for seeding, cultivating, harvesting, and handling farm crops. Whiffle-trees and hitches. Lectures; laboratory; practise in troubles, adjustments, and testing of farm power machines. *I*; (3).

Prerequisite: Agronomy 26 or registration therein, except for seniors.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	2	8	*A, Lecture	—	—	—	—	8	—	F. M.	Reed
			Laboratory	8,9	—	8,9	—	—	—		
			Quiz	—	—	—	—	9	—		
			*B, Lecture	—	—	—	—	8	—		
			Laboratory	—	1,2	—	1,2	—	—		
			Quiz	—	3	—	—	—	—		
			*C, Lecture	1	—	—	—	—	—		
			Laboratory	—	—	1,2	—	1,2	—		
			Quiz	2	—	—	—	—	—		
			*D, Lecture	1	—	—	—	—	—		
			Laboratory	—	8,9	—	8,9	—	—		
			Quiz	—	—	—	—	—	11		

3. Farm Power Machinery.—The horse as a motor, windmills, water-power, steam engines, hot-air engines, electric motors—their theory, operation, and economy. Internal combustion engines and tractors—methods of ignition, theory, operation, and economy. Transmission of farm power and its application to farm operation. Lectures; laboratory. (Alternating with Mechanical Engineering 71 and 73 if desired.) *II*; (3).

Prerequisite: Agronomy 26 or registration therein, except for seniors.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	3	3	A	8,9	—	8,9	—	8,9	—	201 F. M.	Dickerson
			B	8,9	8,9	—	8,9	—	—	201 F. M.	Dickerson
			C	1,2	—	1,2	—	1,2	—	201 F. M.	Dickerson

4. Farm Buildings.—Construction materials; construction, arrangement, design, and cost estimation of machine sheds, granaries, cribs, silos, poultry houses, swine houses, various types of barns, and farm residences. Recitations and drafting. *I*; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	4	2	—	1,2	—	1,2	—	1,2	—	205 F. M.	White

7. Advanced Farm Crops.—Climatic and soil factors in relation to crop production; meadows and pastures; rotation; distribution of labor; cost of production; pure seed production; supply and consumption of products and by-products of farm crops; storage and marketing. Lectures; assigned reading; laboratory; demonstrations. *II*; (3).

Prerequisite: Agronomy 25, Chemistry 13a, and either Botany 3b or an approved equivalent in science (consult instructor).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	7	2	A	2	—	2	—	2	—	702 Ag.	Burlison
			B	—	2	—	2	—	11	702 Ag.	

* Sections A and B are for students who have had farm experience equivalent to at least two full years of four consecutive seasons each; sections C and D are for students who have not had the above experience.

Agronomy

8. Special Farm Crops.—Special crops in which the student is interested. Reading; experiments by pot culture in the greenhouse or by plots in the field. Under special arrangement part of this work may be done during summer vacation. *II*; *(2 to 5).

Prerequisite: Agronomy 7.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	8	*2 to 5	—	—	—					(Arrange)	Burlison Morison

9. Soil Physics and Management.—Origin and formation of soil material; mechanical composition and classification; moisture; texture as affecting capillarity, osmosis, diffusion, temperature, aeration, and as affected by plowing, harrowing, cultivating, rolling, and cropping; wasting by washing, fall or spring plowing and drainage as affecting moisture, temperature, and root development; real and apparent specific gravity, porosity, water holding capacity, and capillary power; the physical effects of different systems of rotation and of continuous cropping with various crops. Lectures; laboratory. *I* or *II*; (5).

Prerequisite: Chemistry 13a, and one unit of entrance or university physics. Irregular students should consult instructor.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Agronomy	9	5	A, Lecture	8	8	8	—	—	—	701 Ag.	Mosier	
			A, Quiz	9	—	—	—	—	—	302 Ag.	Gustafson	
			A, Laboratory	—	9	9	8,9	8,9	—	650 Ag.	Fisher	
			B, Lecture	10	10	10	—	—	—	701 Ag.	Torgerson	
			B, Quiz	11	—	—	—	—	—	128 Ag.	Mosier	
			B, Laboratory	—	11	11	10,11	10,11	—	650 Ag.	Gustafson	
											Fisher	
SECOND SEMESTER												
			Lecture	8	8	8	—	—	—	701 Ag.	Mosier	
			Quiz	9	—	—	—	—	—	302 Ag.	Gustafson	
			Laboratory	—	9	9	8,9	8,9	—	650 Ag.	Fisher	
											Torgerson	

10. Special Work in Soil Physics.—Physical properties of special soils; physical analysis; determination of hygroscopic and wilting coefficients and moisture equivalents; effect of tillage on physical factors as related to crop growth in field and greenhouse. Students may work with special soils. Under special arrangement part of this work may be done during summer vacation. *I* or *II*; *(2-5). *Time to be arranged.*

Professor MOSIER, Assistant Professor GUSTAFSON, Mr. FISHER

Prerequisite: Agronomy 9, and approval of the Soil Physics division.

11. Soil Biology.—Quantitative studies of the biochemical activities of soil microorganisms with respect to fertility, factors influencing the bacteria, protozoa, algæ, and fungi; isolation and study of organisms; action on insoluble mineral plant food; fermentation of crop residues, green and farm manures;

* In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

nitrogen fixation, assimilation, and preservation, and similar studies of the other essential elements. Lectures; quiz; laboratory. *II*; (5).

Prerequisite: Agronomy 12 and Bacteriology 1, 5, or 20, or the equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	11	5	Lecture	8	—	8	—	—	—	302 Ag.	Whiting
			Quiz	—	—	—	—	8	—	302 Ag.	Whiting
			Laboratory	1,2	—	1,2	—	1,2	—	321 Ag.	Schoonover

***12. Soil Fertility, Fertilizers, Rotations.**—The influence of fertility upon yield; effect of different crops upon the soil and upon succeeding crops; different rotations; ultimate effect of different systems of farming upon fertility and productivity; composition and value of manures and fertilizers, soils cropped continuously with different crops and with a series of crops; the fertility of soils of different types from different sections of Illinois.† Lectures; laboratory. *II*; (5).

Prerequisite: Chemistry 13a; Agronomy 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	12	5	Lecture	—	8	—	8	—	—	Morrow Hall	Hopkins
			A-1, Quiz	—	9	—	9	—	—	302 Ag.	Bauer Wyatt Snider
			A-2, Quiz	—	9	—	9	—	—	128 Ag.	
			B-1, Quiz	—	—	8	—	8	—	702 Ag.	
			B-2, Quiz	—	—	8	—	8	—	Morrow Hall	
			C-1, Quiz	3	—	3	—	—	—	701 Ag.	Bauer Wyatt Snider Gilkerson
			C-2, Quiz	3	—	3	—	—	—	701 Ag.	
			A, Laboratory	8,9	—	8,9	—	8,9	—	218 Ag.	
			B, Laboratory	—	9,10,11	—	9,10,11	—	—	650 Ag.	
			C, Laboratory	—	1,2,3	—	1,2,3	—	—	218 Ag.	

***12a. Soil Fertility, Fertilizers, Rotations.**—The same as Agronomy 12, for advanced students. Lectures; quiz. *II*; (2).

Prerequisite: Graduate standing, or advanced undergraduate standing with the approval of the division.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	12a	2	Lecture	—	8	—	8	—	—	Morrow Hall	Hopkins
			A-1, Quiz	—	9	—	—	—	—	302 Ag.	Wyatt
			A-2, Quiz	—	—	8	—	—	—	702 Ag.	Bauer
			A-3, Quiz	3	—	—	—	—	—	201 Ag.	Snider

13. Investigation of the Fertility of Special Soils.—Soils in which the student is interested. Nature and quantity of the elements of fertility; effect of different fertilizers, as determined by pot cultures and by pot experiments; systematic study of similar work of experiment stations and experimenters. *I*; *(2-5).

Prerequisite: Agronomy 12.

*A required inspection trip to certain soil experiment fields or farms will be arranged in May or early June, in connection with courses 12 and 12a, which will require an expense of about \$10 on the part of the student.

†The student is advised to collect in advance a representative composite sample of surface soil (at least 6 pounds) from land in which he is interested (see page 44 of the Soil Fertility Laboratory Manual, or Illinois Experiment Station Circular 150).

Agronomy

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Agronomy	13	*2-5	—	(Arrange)					218 Ag.	Stewart Wyatt

16. German Agricultural Readings.—The current numbers of German journals of agricultural science used as texts, with special attention to soils and crops. *II*; (2).

Prerequisite: Two years' work in German; Agronomy '12.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Agronomy	16	2	—	(Arrange)					214 Ag.	Hopkins

17. Harvesting Machinery.—Expert work on grain binders, corn binders, mowers, hay rakes, loaders, and stackers. (For students preparing to do expert work in the field. Before registering in this course students are requested to consult instructor regarding requirements for experting.) *II*; (3).

Prerequisite: M. E. 1; Agronomy 2, and Agronomy 3 or registration therein.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	17	3	A	—	8,9	—	8,9	—	8,9	F. M.	Reed
			B	—	1,2	—	1,2	—	10,11	F. M.	Reed

18a-18b. Investigation and Thesis.—*I, II*; *(5-10).

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Agronomy	18a	*5 to 10	—	(Arrange)						Hopkins Mosier Smith Stewart Burlison Whiting
Agronomy	18b	*5 to 10	—	SECOND SEMESTER (Arrange)						

19a-19b. Research Work in Farm Mechanics.—Consult instructor regarding time and requirements. *I, II*; *(1-5).

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Agronomy	19a	*1 to 5	—	(Arrange)						White Dickerson Jahr Reed
Agronomy	19b	*1 to 5	—	SECOND SEMESTER (Arrange)						

20. Farm Concrete Construction.—Materials used in concrete construction; mixing and placing; simple comparative tests; specifications and estimates for farm concrete construction. Lectures; laboratory. *II*; (2).

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Agronomy	20	2	A	—	10,11	—	10,11	—	—	201 F. M.	Jahr
			B	—	1,2	—	1,2	—	—	201 F. M.	Jahr

22. Plant Breeding.—The improvement by breeding of field crops, including grains, grasses, and legumes; general principles involved, with practical applications. Lectures, assigned reading, demonstrations, and laboratory.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

(Schedule is so arranged that this course may be taken in conjunction with Agronomy 7.) *II*; (2).

Prerequisite: Botany 1; Chemistry 13a; Agronomy 25.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Agronomy	22	2	—	1,2	—	1,2	—	—	—	600 Ag.
										Instructor Smith

23. Plant Food Supplies.—The world's supply of plant-food materials; utilization and conservation. *II*; (1).

Prerequisite: Agronomy 12.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	23	1	—	(Arrange)						316 Ag.	Stewart

25. Farm Crops.—Plant growth; structure; principles governing the production and harvesting of common farm crops; habits, characteristics, requirements, means of improvement; common diseases, insects, and their control; weed seed identification; methods of weed control; seed testing for purity and germination; market grades of grain; grain judging. *I* or *II*; (4).

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	25	4	A, Lecture	9	—	9	—	—	—	701 Ag.	} Burlison Walworth Morison Brockson
			Quiz	—	—	—	—	9	—	701 Ag.	
			Laboratory	—	8,9	—	8,9	—	—	600 Ag.	
			B, Lecture	2	—	2	—	—	—	701 Ag.	
			Quiz	—	—	—	—	2	—	701 Ag.	
			Laboratory	—	1,2	—	1,2	—	—	600 Ag.	
			C, Lecture	11	—	11	—	—	—	701 Ag.	
			Quiz	—	—	—	—	11	—	701 Ag.	
			Laboratory	—	10,11	—	10,11	—	—	600 Ag.	

26. Elementary Farm Mechanics.—Ropes, soldering, babbitting, belt lacing, pipe cutting, plumbing, sewage disposal, farm water systems, lighting systems, heating systems, power transmission, elementary mechanics, and equalizers. Design of farm power plant. *I* or *II*; (3).

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	26	3	A, Quiz	—	8	—	—	3	—	201 F. M.	White
			Drafting	—	9	—	—	—	—		
			Laboratory	—	—	—	8,9	—	—		
			B, Quiz	—	—	10	—	10	—		
			Drafting	—	—	—	—	11	—		
			Laboratory 10,11	—	—	—	—	—	—		
			C, Quiz	—	1	—	1	—	—		
			Drafting	—	—	—	2	—	—		
			Laboratory	—	2,3	—	—	—	—		
			D, Quiz	8	—	—	—	8	—		
			Drafting	9	—	—	—	—	—		
			Laboratory	—	—	8,9	—	—	—		

27. Drainage Design.—Designing of tile drainage systems from level note data and contour maps; estimating sizes, amounts, and cost of tile, and cost of system; designing of outlet open ditch system for drainage districts; esti-

Agronomy

mation of sizes and costs; drainage district laws; preparing bids on contract jobs; advanced field work. *I*; *(1-5).

Prerequisite: Agronomy 1, or Civil Engineering 96, 31, or 32.

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
Agronomy	27	*1 to 5	—	(Arrange)					Room
									205 F. M.
									Instructor
									Jahr

Courses for Graduates

101. Soil Investigations.—Systems of soil investigations; sources of error and methods of control; interpretation of results. *Twice a week; II; (1 unit).*

EITHER SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
Agronomy	101	1 unit	—	(Arrange)					Room
									316 Ag.
									Instructor
									Stewart

103. Soil History.—Ultimate effect upon the soil of systems of agricultural practise. *II; (½ to 1 unit).*

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
Agronomy	103	½ to 1 unit	—	(Arrange)					Room
									214 Ag.
									Instructor
									Hopkins

104. Seminar in Agronomy.—Critical study by graduate students, faculty, and staff members of current literature on the subject of soils and crops. *Once a week; I, II; (½ unit).*

BOTH SEMESTERS									
Subject	No.	Credits	Section	M	T	W	T	F	S
Agronomy	104	½ unit	—	(Arrange)					Room
									301 Ag.
									Instructor
									Whiting and others

112. Plant Breeding.—A detailed study of experiments at this station; methods and results reported from other states and from foreign countries. *I, II; (½ to 2 units).*

BOTH SEMESTERS									
Subject	No.	Credits	Section	M	T	W	T	F	S
Agronomy	112	½ to 2 units	—	(Arrange)					Room
									110 Ag.
									Instructor
									Smith

114. Crop Production.—Crop ecology; methods and results of crop production; methods and results of crop production investigations. *I, II; (½ unit).*

BOTH SEMESTERS									
Subject	No.	Credits	Section	M	T	W	T	F	S
Agronomy	114	½ unit	—	(Arrange)					Room
									—
									Instructor
									Burlison

118. Investigation.—*I, II; (1 to 2 units).*

BOTH SEMESTERS									
Subject	No.	Credits	Section	M	T	W	T	F	S
Agronomy	118	1 to 2 units	—	(Arrange)					Room
									} Ag.
									Instructor
									Hopkins
									Smith
									Stewart
									Mosier
									Whiting
									Burlison

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

ANIMAL HUSBANDRY

(Including FARM MANAGEMENT)

HERBERT WINDSOR MUMFORD, B.S., *Professor, Animal Husbandry*
 HARRY SANDS GRINDLEY, D.Sc., *Professor, Animal Nutrition*
 WALTER CASTELLA COFFEY, M.S., *Professor, Sheep Husbandry*
 HENRY PERLY RUSK, M.S., *Professor, Cattle Husbandry*
 JAMES LLOYD EDMONDS, B.S., *Assistant Professor, Horse Husbandry*
 JOHN A DETLEFSEN, D.Sc., *Assistant Professor, Genetics*
 WALTER FREDERICK HANDSCHIN, B.S., *Assistant Professor, Animal Husbandry*
 DANIEL OTIS BARTO, B.S., *Associate, Poultry Husbandry*
 SLEETER BULL, M.S., *Associate, Animal Nutrition*
 HAROLD HANSON MITCHELL, PH.D., *Associate, Animal Nutrition*
 WILLIAM HERSCHEL SMITH, M.S., *Associate, Animal Husbandry Extension*
 GILBERT GUSLER, B.S., *Associate, Animal Husbandry*
 ELMER ROBERTS, B.S., *Instructor, Genetics*
 WILBUR JEROME CARMICHAEL, M.S., *Instructor, Animal Husbandry*
 CHARLES IVAN NEWLIN, M.S., *Instructor, Animal Husbandry*
 JAMES BURTON ANDREWS, B.S., *Instructor, Animal Husbandry*
 ROSCOE RAYMOND SNAPP, B.S., *Instructor, Animal Husbandry*
 CLAUDE HARPER, B.S., *Assistant, Animal Husbandry*
 JAMES WILBUR WHISENAND, M.S., *Assistant, Animal Husbandry*
 EARL KIRKWOOD AUGUSTUS, B.S., *Assistant, Animal Husbandry*
 ROY HAROLD WILCOX, B.S., *Assistant, Animal Husbandry*
 MAYNARD ELMER SLATER, B.S., *Assistant, Animal Nutrition*
 JOHN BENJAMIN RICE, B.S., *Assistant, Animal Husbandry*
 HENRY CARL ECKSTEIN, B.S., *Assistant, Animal Nutrition*

Courses for Undergraduates

Beef Cattle: Animal Husbandry 11a, 11b.

Breeding, Feeding, Management, and Marketing: Animal Husbandry 8, 21, 28, 29, 30, 32, 33; Farm Management 1.

General Judging: Animal Husbandry 1a, 2a, 4a, 5, 11a, 22.

Genetics: Animal Husbandry 30.

Horses: Animal Husbandry 4a, 4b, 17.

Meat: Animal Husbandry 10, 24.

Nutrition: Animal Husbandry 7, 31.

Poultry: Animal Husbandry 23.

Sheep: Animal Husbandry 1a, 1b, 27.

Swine: Animal Husbandry 2a, 2b, 26.

NOTE.—Students registered in advanced courses such as 10, 22, 23, 28, 29, 32, and Farm Management 1, are required to participate in a tour of inspection of representative markets, farms, herds, flocks, and studs.

1a. Sheep: Breeds and Market Classes.—Breeds used for mutton and wool production; types, characteristics, and adaptability; market classes and grades of sheep and wool. Lectures; judging. I; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	1a	2	—	—	10,11	—	10,11	—	—	S. P.	Coffey Harper

Animal Husbandry

1b. Sheep: Breeding, Feeding, and Management.—Pure bred and grade flocks; feeding, housing, and shepherding. Lectures; reference readings. *I*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 1a and 1b the same semester.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	1b	3	—	10	—	10	—	10	—	553 Ag.
										Instructor Coffey Harper

2a. Swine: Breeds and Market Classes.—History of the leading breeds: types, characteristics, and adaptability; market classes and grades; market reports. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	2a	2	—	—	10,11	—	10,11	—	—	S. P.
										Instructor Carmichael Rice

2b. Swine Husbandry.—Economic production of market and breeding hogs. Breeding, feeding, housing, care, sanitation, common diseases, and marketing. Lectures; assigned reading; quizzes. *II*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 2a and 2b the same semester.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	2b	3	—	10	—	10	—	10	—	702 Ag.
										Instructor Carmichael Rice

4a. Market Classes of Horses and Mules and Breeds of Horses.—Market classes, grades, and requirements. History of the leading breeds; types, characteristics, and adaptability. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5, or its equivalent.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	4a	2	—	—	1,2	—	1,2	—	—	S. P.
										Instructor Edmonds Kammlade

4b. Breeding, Feeding, and Management of Horses.—Care of stallions, mares, and foals; of work horses and drivers at labor and idle; fattening horses for market. Lectures; assigned readings. *II*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 4a and 4b the same semester.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	4b	3	—	1	—	1	—	1	—	S. P.
										Instructor Edmonds Kammlade

5. Fundamentals of Live Stock Judging.—Names and location of external parts of the various kinds of live stock; use of the score card, comparative judging, breed identification, and types of farm animals. Required in the freshman year. *I* or *II*; (3).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	5	3	A	8,9	—	8,9	—	8,9	—	S.P.	Gusler
Husbandry			B	10,11	—	10,11	—	10,11	—	S. P.	and others

7. Principles of Animal Nutrition.—Composition and fuel value of feeding stuffs; digestion, absorption, and metabolism of organic and inorganic food stuffs; elimination of metabolic products; co-efficients of digestibility and nutritive value of feeding stuffs. *I*; (5).

Prerequisite: Animal Husbandry 8 and 21; Chemistry 13a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	7	5	Lecture	—	—	11	—	—	—	702 Ag.	Grindley
Husbandry			A, Quiz	—	11	—	11	—	—	}	Grindley Mitchell Slater
			B, Quiz	—	11	—	11	—	—		
			C, Quiz	11	—	—	—	11	—		
			D, Quiz	11	—	—	—	11	—		
			A, B, Lab.	10,11	—	—	—	10,11	—		
			C, D, Lab.	—	10,11	—	10,11	—	—		

8. Principles of Breeding.—Elemental facts of evolution and genetics; origin of domesticated animals and plants; history of systematic breeding; the relation to genetics of old and new theories of breeding. Required in the sophomore year. *I* or *II*; (1).

NOTE.—See Animal Husbandry 21.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	8	1	Lecture	—	—	—	8	—	—	702 Ag.	Detlefsen, Roberts, Thorne, and others
Husbandry			A, Quiz	—	—	—	—	8	—		
			B, Quiz	—	—	—	—	8	—		
			C, Quiz	—	—	—	—	9	—		
			D, Quiz	—	—	—	—	9	—		
			E, Quiz	—	—	—	—	—	10		
			F, Quiz	—	—	—	—	—	10		
			G, Quiz	—	—	—	—	1	—		

9. Investigation and Thesis.—

I or *II*; *(5-10).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	9	*5 to 10	—	—	—	—	—	—	—	(Arrange)	
Husbandry			—	—	—	—	—	—	—		

10. Meat.—Farm butchering, curing, and care of meats; yield, quality, and values of meat and by-products, as related to breeding, feeding, and health of animals; classes, grades, and cuts of meat in wholesale and retail markets. The class will leave on its annual Chicago trip, Thursday morning, April 5, 1917. The cost will be about \$8.00. *II*; (3).

Prerequisite: Two years of university work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal	10	3	—	—	9	—	9	—	—	128 Ag.	Coffey
Husbandry			A, Lab.	—	—	—	—	1,2	—	S. P.	Augustus
			B, Lab.	—	—	—	—	—	8,9		

*In registering for a course with variable credit hours a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Animal Husbandry

11a. Beef Cattle.—Breeds and market classes; history of the leading breeds; beef type from the standpoint of the butcher, the feeder, and the breeder; classification and value of each grade according to current market reports. Judging; lectures; quizzes; assigned readings. *I*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	11a	2	—	—	1,2	—	1,2	—	—	S. P.	Rusk Snapp

11b. Beef Production.—Breeding and management of pure bred herds; breeding for market; combined beef and milk production; economic factors in cattle feeding; influence of age, grade, breed, condition, and sex; equipment; pork and manure as by-products of beef production. Lectures; quizzes; assigned readings (text book). *I*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 11a and 11b simultaneously.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	11b	3	—	2	—	2	—	2	—	702 Ag.	Rusk Snapp

15. Dairy Cattle.—(See Dairy Husbandry 2 and 16.)

[17. Education and Driving of the Horse.—Mental qualities, peculiarities, and limitations of the horse; education and training for labor or the road; correct driving; responsibilities of the driver; courtesies of the highway. Lectures; readings; practise. *II*; (2). Not given, 1916-17.

Assistant Professor EDMONDS

Prerequisite: Animal Husbandry 4a and 4b; three semesters' work in the University or its equivalent.]

21. Principles of Feeding.—Classification, digestibility, and functions of feed nutrients; classification and values of feeding stuffs; feed requirements and calculation of balanced rations for farm animals. Required in the sophomore year. *I* or *II*; (2).

Prerequisite: Chemistry 1 or 1a, Chemistry 2 and 3, Animal Husbandry 5, and registration in Animal Husbandry 8.

NOTE.—To arrange their schedule most efficiently students should register in the same section as in Animal Husbandry 8.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	21	2	Lecture	—	8	—	—	—	—	702 Ag.	Bull
			A, Quiz	8	—	8	—	—	—		Bull, Whisenand, and others
			B, Quiz	8	—	8	—	—	—		
			C, Quiz	9	—	9	—	—	—		
			D, Quiz	9	—	9	—	—	—		
			E, Quiz	—	10	—	10	—	—		
			F, Quiz	—	10	—	10	—	—		
			G, Quiz	1	—	1	—	—	—		

22. Advanced Stock Judging.—Animal conformation, quality, and condition with reference to market and show yard requirements; selection of horses, beef cattle, sheep, and swine, for feed lot, market, and exhibition; judging at live

stock shows. Dec. 21, 22, and 23, 1916, will be spent in visiting breeders in northern Illinois and southern Wisconsin, and in a visit to the University of Wisconsin. The cost of this trip will be about \$25.00. *I*; (3).

Prerequisite: Animal Husbandry 1a, 2a, 4a, 11a, or their equivalents.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	22	3	—	3	3	3	3	3	—	S. P.	Mumford and heads of divisions

23. Poultry: Types, Breeds, and Varieties.—Exhibiting and judging; principles of breeding; poultry houses and equipment; feeding, hatching, and brooding; market eggs and poultry; crate-fattening and dressing; diseases and their treatment. A limited number of short trips are taken, the total cost of which will not exceed \$10.00. *II*; (5).

Prerequisite: Animal Husbandry 5, or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	23	5	—	11	11	11	11	11	—	S. P.	

24. Meat.—Influence of type, condition, age, sex, and feeds upon the yield and market grade of meat products. *II*; *(2-5). *Time to be arranged.*

Professor COFFEY

Prerequisite: Animal Husbandry 10, and 1a or 2a or 11a; three years' work in the University, or its equivalent.

26. Swine Husbandry.—Special problems. *II*; *(2-5). *Time to be arranged.*

Mr. CARMICHAEL

Prerequisite: Animal Husbandry 2a, 2b; three years' work in the University, or its equivalent.

27. Sheep Husbandry.—Factors determining the importance of the industry in leading sheep growing countries, particularly different parts of the United States. *II*; *(2-5). *Time to be arranged.*

Professor COFFEY

Prerequisite: Animal Husbandry 1a, 1b; three years' work in the University, or its equivalent.

28. Advanced History of Breeds of Live Stock.—Horses, beef cattle, sheep, and swine. Methods of great breeders; performances and pedigrees of famous animals; breed type as exemplified in the University and other herds. Lectures; assigned readings; problems. Dec. 21, 22, and 23, 1916, will be spent in visiting breeders in northern Illinois and southern Wisconsin and in a visit to the University of Wisconsin. The cost of the trip will be about \$25.00. *I*; *(3-5).

Breeds offered, 1916-17

Beef cattle.....Shorthorns, Aberdeen Angus
Horses.....Percherons, Belgians, Standard breds
Swine.....Berkshires, Duroc Jerseys
Sheep.....Shropshires, Southdowns

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Animal Husbandry

Breeds offered, 1917-18

Beef cattle.....	Herefords, Galloways
Horses.....	Shires, Clydesdales, American Saddlers
Swine.....	Poland Chinas, Chester Whites
Sheep.....	Rambouillets, Oxford Downs

Prerequisite: "a" and "b" courses in class of live stock elected. See note at the beginning of the description of animal husbandry courses.

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
Animal Husbandry	28	*3 to 5	—	9	—	9	—	9	—
								128 Ag.	Mumford and heads of divisions

29. Systems of Live Stock Farming.—Management, climate, soil, topography, location with reference to markets; the supply of land, labor, capital, and managing ability as factors in influencing the choice and adaptation of systems of production. Planning of farms for mixed and live stock systems. The class will visit some of the farms included in the Farm Management investigations being conducted by the department. This trip will cost about \$15.00. *II*; (2).

Prerequisite: Animal Husbandry 5, 8, and 21, and 6 hours' credit from 1b, 2b, 4b or 11b; Farm Management 1. See note at beginning of description of animal husbandry courses.

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
Animal Husbandry	29	2	—	8	—	8	—	—	—
								128 Ag.	Handschin Wilcox

30. Genetics.—Heredity, variation, elements of biometry, and their practical application to breeding. Lectures; demonstrations; laboratory. *II*; (5).

Prerequisite: Two years of university work. Before registering, students must secure the approval of the instructor.

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
Animal Husbandry	30	5	—	11	11	11	11	11	—
								702 Ag.	Detlefsen Roberts Thorne

31. Advanced Course in Animal Nutrition.—Digestion; histology and composition of the body tissues; metabolism of the different food nutrients, and the factors regulating it; effect of the food nutrients on metabolism; the fasting catabolism; food requirements and feeding standards; growth; the nutritive value of the different proteins and amino acids. Lectures; recitations; laboratory. *II*; (5). *Time to be arranged.* Dr. MITCHELL

Prerequisite: Animal Husbandry 7 or Chemistry 15. An elementary knowledge of organic chemistry is also desirable.

32. Marketing Live Stock.—Markets and methods of marketing live stock and their products. Advertising and sale of surplus pedigreed live stock. Certain inspection trips will be required of the class. The expense of these trips will be about \$15.00. *II*; (2).

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Prerequisite: Two years of university work. At least 4 credits in Animal Husbandry 1a, 2a, 4a, and 11a. See note at beginning of description of animal husbandry courses.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	32	2	—	—	9	—	9	—	—	(Arrange)	Mumford Wilcox

33. Animal Husbandry Practicums.—Designed to give a working knowledge of the operations necessary in the barn and stable management of live stock. One hour credit will be given for each two classes of live stock elected. *II*; *(1-2).

Prerequisite: Limited to senior students specializing in Animal Husbandry.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	33	*(1 to 2)	—	—	—	—	—	—	8,12	—	Heads of divisions

(Mornings and evenings as required by instructor.)

Courses for Graduates

Students entering graduate work in animal husbandry must have a thoro training in the fundamental principles of the subject either in connection with or in addition to an agricultural course of study substantially equivalent to that offered in this University.

103. Live Stock Experimentation.—Objects, methods, and the sources of error in experimental work dealing with the feeding, breeding, and management of farm animals. *Once a week; I, II; (½ unit). Time to be arranged.*
Professor DAVENPORT

[110. Animal Nutrition.—Biochemistry, digestion, metabolism, and nutritive value of the proteins. Lectures; seminar. *Twice a week; I, II; (1 unit). Alternates with Animal Husbandry 111; not given, 1916-1917.*

Professor GRINDLEY, Dr. MITCHELL]

111. Animal Nutrition.—Biochemistry, digestion, metabolism, and nutritive value of the fats and lipoids, the carbohydrates, and the inorganic substances. Lectures; seminar. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor GRINDLEY, Dr. MITCHELL

112. Research.—Opportunity is afforded to pursue investigations along the following lines:

(a) Economic factors involved in meat production.

Professor MUMFORD, Professor COFFEY, Assistant Professor RUSK

(b) Systems of live stock farming. Assistant Professor HANDSCHIN

(c) The valuation of pedigrees. Professor MUMFORD

(d) Animal Nutrition. The chemistry of feeding stuffs; metabolism experiments and biochemical studies connected with the nutrition of farm animals.

Professor GRINDLEY, Dr. MITCHELL

(e) Genetics. Problems in heredity and variation.

Assistant Professor DETLEFSEN

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 1-2, but, 1, or 2.

Architecture

(f) Factors affecting the quality, quantity, strength, and condition of wool.

Professor COFFEY

(a), (b), (c), and (f) one to three times a week; (d) and (e) five times a week; I, II, (1 to 2 units). Time to be arranged.

117. Genetics.—Study and criticism of genetic experiments, biological and mathematical methods employed, and the validity of the conclusions. Three to five times a week; I, II; (1 to 2 units). Time to be arranged.

Assistant Professor DETLEFSEN

FARM MANAGEMENT

1. Elementary Farm Management.—The factors of production in the farm business; systems of farming, their distribution and adaptation; farm organization; the distribution of capital invested; planning of the farm; farm administration or operation; planning of work; handling of labor; development of management efficiency. Lectures; quiz. The trip required in this course is the same as in Animal Husbandry 29. II; (3).

Prerequisite: Three semesters of required work; Economics 1 or 2 and Accountancy 11.

It is also very important that the student have credit or be registered in Agronomy 12, and have at least 6 hours credit in Animal Husbandry 1b, 2b, 4b, or 11b.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Farm Management	1	3	—	2	—	2	—	2	—	702 Ag.
										Instructor Handschin Andrews

ARCHITECTURE

LORING HARVEY PROVINE, B.S., A.E., *Professor*

NATHAN CLIFFORD RICKER, D.Arch., *Professor*

NEWTON ALONZO WELLS, M.P., *Professor, Architectural Decoration*

JAMES McLAREN WHITE, B.S., *Professor, Architectural Engineering, Supervising Architect*

PERCY ASH, B.S., C.E., *Assistant Professor, Architectural Design*

WILLIAM CALDWELL TITCOMB, A.B., B.S., *Assistant Professor*

CHARLES RICHARD CLARK, B.S., M.Arch., *Assistant Professor, Architectural Construction*

ROBERT TAYLOR JONES, B.S., *Associate*

WILLIAM MATHEWS HEKKING, B.P., *Associate, Freehand Drawing*

WILLIAM SIDNEY WOLFE, B.S., M.S., *Instructor, Architectural Engineering*

RALPH STANLEY FANNING, B.S., *Instructor, Architectural Design*

WILLIAM MACEY STANTON, B.S., M.S., *Instructor, Architectural Design*

CARL VICTOR BURGER, B.Arch., *Instructor*

OWEN J. T. SOUTHWELL, M.S., *Instructor, Architectural Design*

CYRUS EDMUND PALMER, *Instructor Architectural Engineering*

RALPH EDWARD MUEHLMAN, *Assistant, Architectural Design*

WINIFRED FEHRENPAMP, B.L.S., *Librarian*

13, 14, 15, 16. History of Architecture.—From the Egyptian period to modern times; effects of political, economic and local conditions; influence of material, climate, structural systems, the various countries and periods; evolution of architectural forms. Illustrated lectures; quizzes. I, II; (2).

Prerequisite: Sophomore standing in architecture or architectural engineering, or Architecture 31 and 32.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	13	2	A B	11	—	11	—	—	—	221 E. H.	Ricker
			C D	9	—	9	—	—	—	221 E. H.	Ricker

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	14	2	A B	11	—	11	—	—	—	221 E. H.	Ricker
			C D	9	—	9	—	—	—	221 E. H.	Ricker

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	15	2	A B	—	9	—	9	—	—	221 E. H.	Ricker
			C D	—	11	—	11	—	—	221 E. H.	Ricker

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	16	2	A B	—	9	—	9	—	—	221 E. H.	Ricker
			C D	—	11	—	11	—	—	221 E. H.	Ricker

23-24. Freehand Drawing.—Charcoal drawing from the cast. Water color work. *Six hours drawing a week. I, II; (2).*

Prerequisite: Architecture 32.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	23	2	A	1-4	—	1-4	—	—	—	405 E. H.	Burger
			B	—	1-4	—	1-4	—	—	405 E. H.	Wells

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	24	2	A	1-4	—	1-4	—	—	—	405 E. H.	Hekking
			B	—	1-4	—	1-4	—	—	405 E. H.	Wells

25. Freehand Drawing.—Principles underlying arrangement of form and color; rhythm and sequence; harmony and contrast. *Six hours drawing a week. I; (2).*

Prerequisite: Architecture 23-24.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	25	2	A	—	—	1-4	—	1-4	—	406 E. H.	Wells
			B	—	—	8-11	—	8-11	—	406 E. H.	Wells

26. Freehand Drawing.—Charcoal, pen, pencil, and water color drawing from the cast and from still life. Out-of-door sketching. *Six hours drawing a week. II; (2).*

Prerequisite: Architecture 23-24.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	26	2	A	—	—	1-4	—	1-4	—	406 E. H.	Wells
			B	—	—	8-11	—	8-11	—	406 E. H.	Wells

27. Freehand Drawing.—Sketching from still life; study of proportions. *Six hours drawing a week. I; (2).*

Prerequisite: Architecture 25-26.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	27	2	A	—	8-11	—	8-11	—	—	406 E. H.	Hekking
			B	—	1-4	—	1-4	—	—	406 E. H.	Hekking

Architecture

28. Freehand Drawing.—Water color; original decorative composition; out-of-door sketching. *Six hours drawing a week. II; (2).*

Prerequisite: Architecture 25-26.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	28	2	A	—	8-11	—	8-11	—	—	406 E. H.	Hekking
			B	—	1-4	—	1-4	—	—	406 E. H.	Hekking

31. Architectural and Freehand Drawing.—Instruments, pen, pencil, and brush; lettering; shades and shadows; perspective. Charcoal drawing from the cast. *One lecture and ten hours drawing a week. I; (4).*

Prerequisite: Registration in General Engineering Drawing 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	31	4	A	—	—	—	—	8	—	221 E. H.	Muehlman Fanning Burger
			A	—	—	—	—	1-3	10-12	405 E. H.	
			A	1-4	—	1-4	—	—	—	—	
			B	—	—	—	—	3	—	221 E. H.	
			B	10-12	—	—	—	10-12	—	405 E. H.	
			B	—	1-4	—	1-4	—	—	309 E. H.	
			C	—	—	—	—	3	—	221 E. H.	
For students taking	{		C	—	—	8-10	—	—	8-10	405 E. H.	
Landscape			C	8-11	—	—	—	8-11	—	309 E. H.	
Gardening			D	—	—	—	—	3	—	221 E. H.	
			D	8-10	—	—	—	8-10	—	405 E. H.	
			D	—	8-11	—	8-11	—	—	309 E. H.	

32. Architectural and Freehand Drawing.—Elements of architecture; walls, moldings, doors, windows, the Orders, vaults, roofs, stairs. Wash rendering, stereotomy, charcoal drawing from the cast. Lectures and sketching *One lecture and ten hours of drawing a week. II; (4).*

Prerequisite: Architecture 31.

SECOND SEMESTER												
Subject	No.	Credits	Section	M.	T	W	T	F	S	Room	Instructor	
Architecture	32	4	A	—	—	—	—	8	—	221 E. H.	Muehlman Fanning Burger	
			A	—	—	—	—	1-3	10-12	405 E. H.		
			A	1-4	—	1-4	—	—	—	312 E. H.		
			B	—	—	—	—	3	—	221 E. H.		
			B	10-12	—	—	—	10-12	—	405 E. H.		
			B	—	1-4	—	1-4	—	—	312 E. H.		
For students taking			C	—	—	—	—	3	—	221 E. H.		
Landscape			C	—	—	8-10	—	—	8-10	405 E. H.		
Gardening			C	8-11	—	—	—	8-11	—	312 E. H.		
			D	—	—	—	—	3	—	221 E. H.		
			D	8-10	—	—	—	8-10	—	405 E. H.		
			D	—	8-11	—	8-11	—	—	312 E. H.		

33-34. Design.—(Elementary.) Rendered order and sketch problems involving simple composition; library research in elements of composition. *One lecture and nine hours of drawing a week. I, II; (3).*

Prerequisite: Architecture 31, 32.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	33	3	A	—	—	—	—	8	—	221 E. H.	Titcomb Stanton
			A	—	1-4	—	1-4	—	8-11	319 E. H.	
			B	—	—	—	—	8	—	221 E. H.	
			B	1-4	—	1-4	—	1-4	—	319 E. H.	

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	34	3	Sections and schedule the same as for 33 (first semester).								

35-36. Design.—(Intermediate.) Rendered plan and sketch problems; library research in plan and interior elements. *Fifteen hours of drawing a week. I, II; (5).*

Prerequisite: Architecture 33-34.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	35	5	A	8-11	—	8-11	—	8-11	8-11	319 E. H.	Titcomb
			A	1-4	—	—	—	—	—	319 E. H.	
			B	8-11	—	—	—	—	8-11	319 E. H.	Stanton
			B	1-4	—	1-4	—	1-4	—	319 E. H.	

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	36	5	Sections and schedule the same as for 35 (first semester).								

37. Design.—(Advanced.) Original design. *Twenty-one hours of drawing a week. I; (7).*

Prerequisite: Architecture 35-36.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	37	7	A	8-11	—	8-11	—	8-11	8-11	408 E. H.	Ash
			A	—	1-4	—	1-4	1-4	—	408 E. H.	
			B	—	8-11	—	8-11	8-11	8-11	408 E. H.	
			B	1-4	—	1-4	—	1-4	—	408 E. H.	

38. Advanced Design or Thesis.—An extended original problem in design or construction. *Twenty-one hours of drawing a week. II; (7).*

Prerequisite: Architecture 37.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	38	7	AB	8-10	—	8-10	—	8-11	8-11	408 E. H.	Ash
			AB	1-4	—	1-4	—	1-4	—	408 E. H.	

43. Working Drawings.—The growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; detailing various parts on a large scale; floors, walls, roofs, doors, windows, cornices, stairs, wainscoting, cabinet-work, interior finish; preparation of working drawings. *Kidder's Building Construction, Part II. Two lectures and four hours of drawing a week. I; (3).*

Prerequisite: General Engineering Drawing 2; Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	43	3	A	—	8	—	8	—	—	108 P. L.	Jones
			A	—	9-11	—	9-11	—	—	319 E. H.	
			B	8	—	8	—	—	—	108 P. L.	Fanning
			B	9-11	—	9-11	—	—	—	319 E. H.	

44. Working Drawings.—Materials for stone masonry; their uses, defects, qualities, and preparation; kinds of masonry and external finish; tools for stone cutting; brick masonry, its materials and bonds; terra cotta design, manufacture, and use; columns, beams, girders, and footings; joints and con-

Architecture

nctions. Working drawings. Kidder's *Building Construction and Superintendence, Part I. Two lectures and four hours of drawing a week. II; (3).*

Prerequisite: General Engineering Drawing 2; Architecture 31, 32, 43.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	44	3	A	—	8	—	8	—	—	108 P. L.	Jones Fanning
			A	—	9-11	—	9-11	—	—	319 E. H.	
			B	8	—	8	—	—	—	108 P. L.	
			B	9-11	—	9-11	—	—	—	319 E. H.	

45. Graphic Statics.—Elementary Graphic Statics; its application to trussed roofs, steel and masonry arches, domes. The graphical representation of reactions, bending moments, shear and deflection in beams. (For architects.) Ricker's *Notes on Graphic Statics. One lecture and six hours of drawing a week. I; (3).*

Prerequisite: Theoretical and Applied Mechanics 14, 15, 16.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	45	3	A B	—	—	—	10	—	—	400 E. H.	Wolfe
			A B	—	1-4	—	1-4	—	—	319 E. H.	

46. Roofs.—Wooden and steel roofs; determination of section of members; design of joints; mill and steel skeleton construction. *One lecture and six hours of drawing a week. II; (3).*

Prerequisite: Architecture 45.

SECOND SEMESTER .											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	46	3	A B	—	—	—	10	—	—	400 E. H.	Wolfe
			A B	—	1-4	—	1-4	—	—	319 E. H.	

55. Building Sanitation.—Plumbing, trap ventilation, removal of wastes; water closets; drains and systems of water supply; sewage disposal; water supply and fixtures in dwellings. (For architects.) Cosgrove's *Principles and Practice of Plumbing. Recitations; lectures; designs for special problems. I; (1).*

Prerequisite: Physics 9a-9b, 10a-10b; Architecture 43, 44.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	55	1	A B	11	—	—	—	—	—	400 E. H.	Jones

59. Domestic Architecture.—(Given in connection with Household Science 2.) Lectures; criticism. *I. Time to be arranged.*

Assistant Professor ASH, Assistant Professor CLARK

60. Special Lectures.—Special lectures on architectural subjects. (For architects.) *II; (1).*

Prerequisite: Senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	60	1	A	10	—	10	—	—	—	—	—

65-66. Theory of Architecture.—Influence of function on architectural

form; plan and elevation; problem analysis. Lectures; research; exercises. *I, II; (1).*

Prerequisite: Registration in Architecture 25, 26.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	65	1	A B	—	10	—	—	—	—	400 E. H.	Wells

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	66	1	Sections and schedule the same as for 65 (first semester).								

67. Theory of Form.—Principles underlying arrangement of form; architectural ornament and composition, proportion and balance. *Six hours of drawing a week. I; (2).*

Prerequisite: Senior standing in architecture.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	67	2	A	1-4	—	1-4	—	—	—	—	—
			B	8-11	—	8-11	—	—	—	—	—

68. Specifications.—General and special clauses and their arrangement; classifying material to facilitate writing specifications; practise in writing several sets; relations of the architect, owner, and builder; office organization; building ordinances; professional ethics. (For architects.) *II; (3).*

Prerequisite: Senior standing in architecture.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	68	3	A	11	—	11	—	11	—	202 E. H.	Clark

99. Inspection Trip.—*I; (no credit). Time to be arranged.*

Prerequisite: Senior standing.

Courses for Graduates

Entrance upon graduate work in architecture presupposes the full undergraduate course in that subject. Semi-weekly conferences are held and additional instruction given in all courses as may be required.

101. Architectural Construction.—Design of special structures. *I, II. Time to be arranged.* Professor RICKER, Professor PROVINCE

102. Sanitation of Buildings.—The planning of sanitation, warming, and ventilation. *I, II. Time to be arranged.* Professor RICKER, Mr. CLARK

103. Advanced Architectural Graphics.—Graphic statics. Unusual types of footings, columns, and trusses. *I or II. Time to be arranged.* Professor RICKER, Professor PROVINCE

104. Architectural Design.—Advanced course. *I or II. Time to be arranged.* Assistant Professor ASH

105. Architectural Practise.—Contracts, specifications, and office methods; architectural jurisprudence. *I or II. Time to be arranged.* Professor RICKER, Professor PROVINCE

106. Advanced Architectural History.—Special research. *I or II. Time to be arranged.* Professor RICKER

ARCHITECTURAL ENGINEERING

33. Architectural Drawing.—Lettering; elements of architecture; walls, mouldings, doors, windows, shades and shadows, perspective, the Orders, vaults, roofs, stairs; wash rendering, stereotomy, charcoal, drawing from the cast. Lectures and sketching. *Nine hours of drawing a week.* I; (3).

Prerequisite: General Engineering Drawing 1, 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	33	3	C	—	—	—	—	1	—	400 E. H.	—
			C	1-4	1-4	—	—	2-4	—	319 E. H.	
			D	—	—	—	—	1	—	400 E. H.	
			D	—	—	1-4	1-4	—	8-10	319 E. H.	

34. Design.—(Elementary.) Rendered order and sketch problems; library research. *Nine hours of drawing a week.* II; (3).

Prerequisite: Architectural Engineering 33.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	34	3	C	—	—	—	—	1	—	400 E. H.	—
			C	1-4	1-4	—	—	2-4	—	319 E. H.	
			D	—	—	—	—	1	—	400 E. H.	
			D	—	—	1-4	1-4	—	10-12	319 E. H.	

35-36. Design.—(Intermediate.) Rendered plan and sketch problems; library research. *Nine hours of drawing a week.* I, II; (3).

Prerequisite: Architectural Engineering 33, 34.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	35	3	C	1-4	—	1-4	—	1-4	—	319 E. H.	Dillenback
			D	—	8-11	—	8-11	—	8-11	319 E. H.	

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	36	3	Sections and schedule the same as for 35 (first semester).								

43. Working Drawings.—The growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; floors, walls, roofs, doors, windows, cornices, stairs, wainscoting, cabinet-work, interior finish; preparation of working drawings. (For architectural engineers.) *One recitation and three hours of drawing a week.* I; (2).

Prerequisite: Architectural Engineering 31; General Engineering Drawing 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	43	2	C	—	—	1	—	—	—	108 P. L.	Jones Fanning
			C	—	—	—	1-4	—	—	319 E. H.	
			D	1	—	—	—	—	—	108 P. L.	
			D	—	1-4	—	—	—	—	319 E. H.	

44. Working Drawings.—Materials for stone masonry; their uses, defects, qualities, and preparation; kinds of masonry and external finish; tools for stone cutting; brick masonry; bonds; terra cotta design, manufacture, and use; columns, beams, girders; joints and connections; preparation of working drawings. *One recitation and three hours of drawing a week.* II; (2).

Prerequisite: Architectural Engineering 33, 43; General Engineering Drawing 1, 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	44	2	C	—	—	1	—	—	—	203 E. L.	} Jones Fanning
			C	—	—	1-4	—	—	319 E. H.		
			D	1	—	—	—	—	203 E. L.		
			D	—	1-4	—	—	—	319 E. H.		

45. Graphic Statics.—Elements, and applications to forces; beams under fixed and moving loads. *One lecture and six hours of drawing a week. I; (3).*

Prerequisite: Theoretical and Applied Mechanics 20; registration in Theoretical and Applied Mechanics 25.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	45	3	C	—	—	11	—	—	—	108 P. L.	} Wolfe
			C	—	8-11	—	8-11	—	—	319 E. H.	
			D	—	—	11	—	—	—	108 P. L.	
			D	8-11	—	8-11	—	—	—	319 E. H.	

46. Advanced Graphic Statics.—The analysis of masonry arches, domes, and vaults; large and unusual forms of roof trusses. *One lecture and six hours of drawing a week. II; (3).*

Prerequisite: Architectural Engineering 45.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	46	3	C	—	—	11	—	—	—	—	} Wolfe
			C	—	8-11	—	8-11	—	—	319 E. H.	
			D	—	—	11	—	—	—	—	
			D	8-11	—	8-11	—	—	—	319 E. H.	

47. Architectural Engineering.—Design and working drawings of trusses, members and joints, plate girders, chimneys; investigations of wind bracing. *Fifteen hours of drawing a week or the equivalent. I; (5).*

Prerequisite: Theoretical and Applied Mechanics 26; Architectural Engineering 44, 46.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	47	5	C	8-11	1-4	8-11	1-4	8-11	—	407 E. H.	} Clark
			D	1-4	8-11	1-4	8-11	1-4	—	407 E. H.	

48. Architectural Engineering.—Design and detail of footings; investigation of framed structures; working drawings. *Fifteen hours of drawing a week or the equivalent. II; (5).*

Prerequisite: Architectural Engineering 47.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	48	5	C	8-11	1-4	8-11	1-4	8-11	—	407 E. H.	} Clark
			D	1-4	9-11	1-4	9-12	1-4	—	407 E. H.	

57. Fireproof Construction.—Principles and design of fireproof construction; the advantages of each type. *Two lectures or recitations a week. I; (2).*

Art and Design

Prerequisite: Theoretical and Applied Mechanics 26; Architectural Engineering 44, 46; registration in Architectural Engineering 47.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	57	2	C	—	9	—	9	—	—	400 E. H.	} Provine
			D	—	2	—	2	—	—	400 E. H.	

58. Fireproof Construction.—(Continuation of first semester's work.) Details and working drawings. *Six hours of drawing a week. II; (2).*

Prerequisite: Architectural Engineering 47, 57; registration in Architectural Engineering 46.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	58	2	C	—	9-11	—	9-12	—	—	407 E. H.	} Provine
			D	—	1-4	—	1-4	—	—	407 E. H.	

68. Estimates and Specifications.—Methods of estimating, illustrated by problems; a study of specifications, their general and special clauses, and arrangement; relations of architect, owner, and builder. (For architectural engineers.) *Four recitations a week. II; (4).*

Prerequisite: Senior standing in architectural engineering.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
A. E.	68	4	C D	11	11	11	—	11	—	400 E. H.	Provine

99. Inspection Trip.—*I; (no credit).* Time to be arranged.

Prerequisite: Senior standing.

ART AND DESIGN

EDWARD JOHN LAKE, B.S., *Assistant Professor*

CHARLES EARL BRADBURY, B.P., *Associate*

MARY MINERVA WETMORE, *Instructor*

GIDEON ROBERT FORBES, M.L.A., *Instructor*

1. Freehand Drawing.—Practise drawing in charcoal and pencil; perspective principles with application; light, shadows, shade, and reflections in monochrome; lectures and reference reading on graphical representation and the reproductive processes in printing. *I or II; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	1	3	A	8,9	—	8,9	—	8,9	—	406 U. H.	Bradbury
			B	10,11	—	10,11	—	10,11	—	406 U. H.	Lake
			C	1,2	—	1,2	—	1,2	—	406 U. H.	Bradbury
			D	—	10,11	—	10,11	—	10,11	406 U. H.	Forbes

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	1	3	A	8,9	—	8,9	—	8,9	—	406 U. H.	Lake
			B	1,2	—	1,2	—	1,2	—	406 U. H.	Forbes

2. Light and Shade.—Shaded drawing in monochrome in preparation for painting in oils and water-colors, with emphasis on values and composition. *II; (2).*

Prerequisite: Art and Design 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	2	2	—	1,2	—	1,2	—	1,2	—	406 U. H.	Bradbury

3a-3b. Drawing from the Antique.—Practise drawing from plaster models and from life of anatomical forms in monochrome in preparation for painting the human figure; anatomical proportion and construction, with lectures on proportion, construction, composition, and action in the representation of the human figure. Either semester may be taken separately. *I, II; (3).*

Prerequisite: Art and Design 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	3a	3	—	10,11	—	10,11	—	10,11	—	403 U. H.	Bradbury

SECOND SEMESTER

Art and Design	3b	3	Schedule the same as for 3a (first semester).								
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4a-4b. Water Color Painting.—Practise painting of still-life; flowers, and sketching out-doors, with application to pictorial and decorative art. *I, II; (3).*

Prerequisite: Art and Design 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	4a	3	—	1-4	—	1-4	—	1-4	—	407 U. H.	Wetmore

SECOND SEMESTER

Art and Design	4b	3	Schedule the same as for 4a (first semester).								
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5a-5b. Drawing from Life.—Drawing in monochrome from life, with application to pictorial and decorative purposes. *I, II, (3).*

Prerequisite: Art and Design 1, 3a or 3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	5a	3	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

SECOND SEMESTER

Art and Design	5b	3	Schedule the same as for 5a (first semester).								
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6a-6b. Portrait in Oil Colors.—Painting in oil colors from costumed model, with especial attention to portrait and character study. *I, II; (3).*

Prerequisite: Art and Design 1, 3a or 3b, 5a-5b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	6a	3	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	6b	3	Schedule the same as for 6a (first semester).								

6c. Portrait in Oil Colors.—(Advanced course.) A continuation of 6a-6b. *II; (3).*

Prerequisite: Art and Design 1, 3a or 3b, 5a-5b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	6c	3	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

Art and Design

7a-7b. Still-Life in Oil Colors.—Practise painting of still-life; flowers and sketching out-doors in oil colors, with application to pictorial and decorative art. *I, II; (3).*

Prerequisite: Art and Design 1, 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 7a	3	3	—	1-4	—	1-4	—	1-4	—	408 U. H.	Wetmore

SECOND SEMESTER											
Art and Design 7b	3			Schedule the same as for 7a (first semester).							

7c. Still-Life in Oil Colors.—(Advanced course.) A continuation of 7a-7b. *II; (3).*

Prerequisite: Art and Design 1, 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 7c	3	3	—	1-4	—	1-4	—	1-4	—	408 U. H.	Wetmore

8a-8b. Modeling.—Clay modeling of anatomical and decorative forms; the making of plaster molds and models; relative study of sculptural art. *I, II; (3).*

Prerequisite: Art and Design 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 8a	3	3	—	—	1-4	—	1-4	—	—	Basement Law Building	Lake

SECOND SEMESTER											
Art and Design 8b	3			Schedule the same as for 8a (first semester).							

10. Sketching.—Practise in pen, pencil; monochrome wash or charcoal rendering from landscape, still-life, and figure, with especial attention to the requirements for reproduction. *I or II; (1).*

Prerequisite: Art and Design 1.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 10	1	1	—	—	—	—	—	—	—	10,11 403 U. H.	Bradbury

12. Design.—The theory and practise of design; lectures on the theory of pure design and the effect of material upon execution; the fitness of various forms of media for different sorts of design; space division and space relations; the theory of color; color schemes and exercises; conventionalization of natural forms for various functions; practise in execution. *I or II; (2).*

Prerequisite: Art and Design 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	12	2	Lecture	10	—	—	—	—	—	410 U. H.	Forbes
			A, Conference	—	—	10,11	—	—	402 U. H.	Forbes	
			B, Conference	—	—	—	—	10,11	—	402 U. H.	Forbes
SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
			Lecture	10	—	—	—	—	—	410 U. H.	Forbes
			A, Conference	—	—	10,11	—	—	—	402 U. H.	Forbes
			B, Conference	—	—	—	—	10,11	—	402 U. H.	Forbes
			C, Conference	—	—	10,11	—	—	—	402 U. H.	Forbes

14. Design.—(Advanced Practise.) Designs executed upon a special field and in a medium selected by the student. Extended study of a chosen field of design. *I* or *II*; (3).

Prerequisite: Art and Design 1, 12.

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Art and Design	14	3	—							402 U. H.
										Forbes

19. History of the Fine Arts.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting previous to the Italian Renaissance. *I*; (2).

Prerequisite: One year of college work.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Art and Design	19	2	—	3	—	3	—	—	—	410 U. H.
										Lake

20. History of the Fine Arts.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting of the Italian Renaissance and to the present time. *II*; (2).

Prerequisite: One year of college work.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	F	W	T	F	S	Room
Art and Design	20	2	—	3	—	3	—	—	—	410 U. H.
										Lake

ASTRONOMY

JOEL STEBBINS, PH.D., *Professor*

FRANK WALKER REED, PH.D., *Instructor*

PETER HORATIO LUCAS, A.B., *Research Assistant*

No major is offered in astronomy. Students may well make mathematics or physics their major, and take astronomy 7, 8, 14, and 15 as a minor.

Upper classmen without mathematical training may elect astronomy 1. Astronomy 4 is for beginners but requires trigonometry. Other courses should be taken in the order: 3, 15, 14, 7, 8.

Courses for Undergraduates

1. Elementary Astronomy.—Lectures; recitations; one evening a week at the observatory. (Mathematics not required.) *I*; (3).

Prerequisite: Sophomore standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Astronomy	1	3	—	11	—	11	—	11	—	228 N. H.
										Stebbins

3. Astronomy for Engineers.—Rough and accurate determinations of latitude, azimuth, and time, especially with the ordinary surveyor's transit; the art of computing. *II*; (3).

Prerequisite: Junior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Astronomy	3	3	—	10,11	—	10,11	—	10,11	—	Obs.
										Stebbins

Bacteriology

4. General Astronomy.—Lectures; recitations; two evenings a week at the observatory. *II; (5).*

Prerequisite: Mathematics 4.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Astronomy	4	5	—	9	9	9	9	9	—	308 L. H.
										Instructor Reed

For Advanced Undergraduates and Graduates

7-8. Theoretical Astronomy.—Celestial mechanics; theory of orbits; perturbations; canonical transformations. *I, II; (3). Time to be arranged.*

Dr. REED

Prerequisite: Mathematics 9.

9-10. Celestial Mechanics.—Properties of canonical systems of differential equations; integration by series; periodic and asymptotic solutions; integral invariants. *I, II; (3). Time to be arranged.*

Dr. REED

Prerequisite: Mathematics 16; Astronomy 7-8.

14. Observational Astronomy.—The working methods of an astronomical observatory; individual problems. *II; (3). Time to be arranged.*

Prerequisite: Astronomy 15.

Professor STEBBINS

15. Geodetic Astronomy.—The sextant, transit, and zenith telescope; methods similar to those of the United States Coast Survey. *I; (3).*

Prerequisite: Mathematics 7.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Astronomy	15	3	—	1,2	—	—	10,11	—	—	Obs.
										Instructor Stebbins

Courses for Graduates

101. Seminar and Thesis.—*Three times a week; I, II; (1 unit). Time to be arranged.*

Professor STEBBINS

102. Stellar Astronomy.—Orbits of binary stars; variable stars; theoretical photometry. *Three times a week; I, II; (1 unit). Time to be arranged.*

Professor STEBBINS

BACTERIOLOGY

(See also Botany.)

JOEL ANDREW SPERRY, 2d, PH.D., *Associate*

CECIL ROBERT GROSS, B.S., *Assistant*

EDWIN F. VOIGT, B.S., *Assistant*

NOTE.—No major is offered for the present in Bacteriology.

1. Elementary Bacteriology.—Laboratory methods; technique and observations on the morphology and general physiology of bacteria and allied microorganisms. Open only to students in the College of Agriculture. *I; (3).*

Prerequisite: Chemistry 3a.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Bacteriology	1	3	Laboratory	1,2	—	1,2	—	1,2	—	367 Ch.
										Instructor —

5. Introductory Bacteriology.—Morphology and physiology of bacteria and related microorganisms; technique of cultivation and observation. *I* or *II*; (5).

Prerequisite: Chemistry 2a.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	5	5	Lecture	10	—	10	—	—	—	228 N. H.	—
			A, Quiz	11	—	11	—	—	—	103 Ch.	Gross
			B, Quiz	1	—	1	—	—	—	103 Ch.	Gross
			A, Laboratory	8,9	—	8,9	—	8,9	—	267 Ch.	Gross, Voigt
			B, Laboratory	—	8,9	—	8,9	—	8,9	267 Ch.	Gross, Voigt

6. Bacteriology for Sanitary Engineers.—Bacteriological and microscopical methods applied to the examination of water and sewage. Theories of filtration, sterilization, and filter control. *I*; (2½).

Prerequisite: Chemistry 10b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	6	2½	Laboratory	2,3	10,11	2,3	10,11	10,11	—	360 Ch.	—

8. Applied Bacteriology.—Decay of organic matter in nature; soil and sewage bacteria; food bacteria; water bacteria; pathogenic bacteria. Laboratory; lectures; assigned readings; reports. *II*; (5).

Prerequisite: Bacteriology 5 or its equivalent; Chemistry 9.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	8	5	Lecture	—	—	8	—	8	—	103 Ch.	—
			Laboratory	—	10, 11	—	10, 11	—	10, 11	360 Ch.	Voigt

Courses for Advanced Undergraduates and Graduates

18a-18b. Journal Meeting.—Required of all students specializing in bacteriology. *I, II*; (1).

Prerequisite: Bacteriology 5, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	18a	1	—	—	—	—	—	—	11	366 Ch.	Sperry

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	18b	1	—	—	—	—	—	11	—	366 Ch.	Sperry

20. General Bacteriology.—(For advanced students who do not major in bacteriology.) Laboratory methods, technique of cultivation and observation and study of biochemical reactions. Laboratory; lectures; assigned readings; reports from Lafar's *Handbuch der technischen Mykologie*, and Kruse's *Allgemeine Mikrobiologie*. Replaces Bacteriology 19. *I*; (5).

Prerequisite: Two years of college chemistry and senior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	20	5	Lecture	11	—	—	—	—	—	115 Ch.	—
			Laboratory	—	1-4	—	1-4	1-4	—	367 Ch.	—

Botany

26. Pathological Bacteriology.—The disease producing organisms, their effect upon the animal, and the reaction of the host. Lectures; laboratory. *II*; (3).

Prerequisite: Bacteriology 5; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	26	3	Laboratory	1,2	—	1,2	—	1,2	—	360 Ch.	Sperry

27. Epidemiology.—The ways in which communicable diseases are spread; methods of control. Lectures. *I*; (2).

Prerequisite: Bacteriology 5; junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	27	2	Lecture	—	11	—	11	—	—	—	Sperry

Courses for Graduates

The work outlined below is open only to graduate students who have had a least one year's work in bacteriology, and satisfactory training in chemistry.

103. Physiology of Bacteria.—The facts and theories of fermentation and growth and death of bacteria. *I*; (1 unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	103	1 unit	Lectures	—	8	—	8	—	—	366 Ch.	Sperry
			Laboratory				(Arrange)			365 Ch.	Sperry

105. Classification of Bacteria.—Variability of species; characters; mutations; standard and biometrical classifications. *II*; (1 unit).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	105	1 unit	Lectures	—	8	—	8	—	—	366 Ch.	Sperry
			Laboratory				(Arrange)			365 Ch.	—

107. Research in Bacteriology.—The physiology of bacteria; food bacteriology. *I, II*; (1 or 2 units).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	107	1 or 2	Laboratory				(Arrange)			365 Ch.	Sperry

BANKING

(See ECONOMICS.)

BIOLOGY

(See BOTANY, ENTOMOLOGY, PHYSIOLOGY, and ZOOLOGY.)

BOTANY

(See also BACTERIOLOGY.)

WILLIAM TRELEASE, D.Sc., LL.D., *Professor*

CHARLES FREDERICK HOTTES, Ph.D., *Professor*

FRANK LINCOLN STEVENS, Ph.D., *Professor*

STELLA MARY HAGUE, Ph.D., *Instructor*

WALTER BYRON McDUGALL, Ph.D., *Instructor*

JOEL ANDREW SPERRY, 2d., PH.D., *Associate, Bacteriology*
 NORA ELIZABETH DALBEY, A.M., *Assistant*
 FORREST ELLWOOD KEMPTON, M.S., *Assistant*
 WILLIAM EUGENE PICKLER, A.B., *Assistant*
 LEE ELLIS MILES, A.B., *Assistant*
 WALTER SPURGEON BEACH, M.S., *Assistant*
 ESTHER YOUNG, A.M., *Assistant*
 CECIL ROBERT GROSS, B.S., *Assistant, Bacteriology*
 HARRY WARREN ANDERSON, A.M., *Assistant*
 CLARENCE MAXWELL CULP, A.B., *Assistant*
 RICHARD ALONZO GANTZ, A.B., *Assistant*
 TRUMAN G YUNCKER, A.M., *Assistant*
 LEO ROY TEHON, A.B., *Assistant*
 EDWIN F VOIGT, B.S., *Assistant, Bacteriology*

Major: 20 hours exclusive of Botany 1, 4, and 4d, made up of courses grouped along one of six lines, according to the suggestions given below.

Minor: 20 hours chosen from chemistry, entomology (exclusive of 1a and 1b), geology, physics, physiology, and zoology. At least eight hours must be offered in one subject.

Courses offered are of four types; the first intended to meet the needs of beginners; the second laying a foundation for methods of accuracy in observation, manipulation, and experimentation through the study of some fundamentally important subdivision of the science; the third giving practise in methods of investigation by the study of advanced problems varied to suit the needs and interests of the student; and the fourth teaching independent research by means of thesis subjects leading to the discovery of new facts or laws.

The work of any semester may be credited separately except when a problem is left incomplete in one of the courses open to graduates.

For the convenience of undergraduates in the College of Liberal Arts and Sciences who elect major work in botany the following combinations of courses are suggested:—(a) General; 2a, 4a, 23, 27a or 27b; (b) Specializing in morphology; 2a, 2b, 3a, 4a, 4b, or 24; (c) Specializing in pathology; 2a or 3a, 7a, 7b, 28a or 28b, 4a, or 17a-17b, or 21; (d) Specializing in physiology; 3a, 27a-27b, 9a or 9b; (e) Specializing in taxonomy; 2a, 4a or 4b, 16a-16b, or 17a-17b, or 26a-26b, or 28a-28b; (f) Specializing in ecology; 4a, 23, 24, 25a, or 25b, and 27a, or 27b.

Students taking botany as a foundation for agronomy or horticulture are advised to select courses 1, 3a, 4a, 7a, and advanced work on some special topic or topics under courses 7b, 9, 17a-17b, or 22b. Students who expect to teach botany are advised to elect 2a, 4a, 23, and advanced work in one or more of the special courses 9a-9b, 16a-16b, 17a-17b, or 28a-28b.

Courses for Undergraduates

1. **General Botany.**—The structure, physiology, natural history, and uses of plants. Lectures, quiz, laboratory. *Students are advised to complete elementary chemistry before taking this course. I or II; (5).*

Botany

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	1	5	Lecture	—	9	—	9	—	—	228 N. H.
			E, Quiz	—	8	—	8	—	—	
			F, Quiz	—	—	10	—	10	—	
			G, Quiz	—	10	—	10	—	—	
			H, Quiz	—	1	—	1	—	—	
			I, Quiz	—	11	—	11	—	—	
(Primarily for Students in Agriculture)										
			A, Laboratory	10,11	—	10,11	—	10,11	—	216 N. H.
			B, Laboratory	1,2	—	1,2	—	1,2	—	216 N. H.
(Primarily for Students in Liberal Arts and Sciences)										
			C, Laboratory	8,9	—	8,9	—	8,9	—	216 N. H.
			D, Laboratory	—	10,11	—	10,11	—	10,11	216 N. H.

McDougall
and
Assistants

2a. Morphology of Thallophytes.—Comparative laboratory study of types of the lower plants.

This and the following course are intended to give personal acquaintance with the vegetable kingdom through the study of living types selected so as to present in natural sequence the increasing complexity of structure and function which marks evolutionary development. *I*; (5).

Prerequisite: Botany 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	2a	5	Lecture	—	2	—	2	—	—	229 N. H.
			Laboratory	1,2	1	1,2	1	1,2	—	306 N. H.

Hague
Hague

2b. Morphology of Cormophytes.—Comparative laboratory study of selected types of the higher plants. *II*; (5).

Prerequisite: Botany 1.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	2b	5	Lecture	—	2	—	2	—	—	229 N. H.
			Laboratory	1,2	1	1,2	1	1,2	—	306 N. H.

Hague
Hague

3a. Plant Anatomy, Histology, and Technique.—The foundation of an exact knowledge of plant structure, especially of protoplasts and their parts and of the behavior and relations of the nucleus; the best methods of fixing, sectioning, staining, and examining tissues, modeling from serial sections, and photomicrography. *II*; (5).

Prerequisite: Botany 1.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	3a	5	Lecture	—	1	—	1	—	—	229 N. H.
			Laboratory	1,2	2	1,2	2	1,2	—	202 N. H.

Hottes
Hottes

4. The Local Flora.—Morphology, identification, and classification of wild plants. A laboratory and field course for students desiring personal acquaintance with the plants of Illinois, and especially for those qualifying as teachers in the public schools. *II*; (3).

Prerequisite: Entrance botany or its equivalent.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	4	3	—	8,9	—	8,9	—	8,9	—	306 N. H.

Hague

4a. Taxonomy of Cormophytes.—Structure, identification, and classification of higher plants. Laboratory; field work on flowering plants, and weeds. *II*; (5).

Prerequisite: Botany 1.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	4a	5	—	10,11	10,11	10,11	10,11	10,11	—	305 N. H.
										Trelease

4b. Taxonomy of Algae and Bryophytes.—Structure, identification, and classification. *I*; (5).

Prerequisite: Botany 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	4b	5	—	8,9	8,9	8,9	8,9	8,9	—	306 N. H.
										Hague

4d. Trees and Shrubs of the Campus.—A systematic study of the woody plants most used for decorative purposes. *I*; (3).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	4d	3	—	8,9	—	8,9	—	8,9	—	308 N. H.
										Trelease

Prerequisite: Botany 1.

7a. Plant Pathology.—Causal agents, symptoms, diagnosis, and treatment. *I*; (5).

Prerequisite: Botany 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	7a	5	—	9	8,9	8,9	8,9	8,9	—	N. H.
										Stevens

20. Plant Diseases.—An information course, for credit in the College of Agriculture only. More important diseases of commonly cultivated plants, diagnosis, and treatment. Lectures and laboratory. *II*; (3).

Prerequisite: Botany 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	20	3	Lecture	10	—	—	—	—	—	N. H.	Stevens
			A, Laboratory	—	—	10,11	—	10,11	—	403 N. H.	Stevens

21. Crop Diseases.—Structure, identification, and treatment. *I*; (3).

Prerequisite: Botany 20 or 7a.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	21	2	Lecture	10	—	—	—	—	—	Botany Annex
			Laboratory	—	—	10,11	—	10,11	—	Stevens

23. Plant Ecology.—The life of plants in their natural habitats, in relation to environment, to animals, and to each other. Lectures; laboratory; field work. *I*; (3).

Prerequisite: Botany 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	23	3	Lecture	—	8	—	8	—	—	229 N. H.	McDougall
			Laboratory or Field	—	—	—	—	—	8-12	308 N. H.	McDougall

24. Taxonomy and Ecology of the Higher Fungi.—Structure, identification, classification, and ecological relations. Special attention is given to edible and poisonous mushrooms. Lectures; laboratory; field work. *II*; (3).

Prerequisite: Botany 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	24	3	Lecture	—	8	—	8	—	—	229 N. H.	McDougall
			Laboratory or Field	—	—	—	—	—	8-12	308 N. H.	McDougall

27a. Plant Physiology.—The absorption of materials from external work and their transformation within the organism; the production and use of food. *I*; (5).

Prerequisite: Botany 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	27a	5	Lecture	—	11	—	11	—	—	229 N. H.	Hottes
			Laboratory	10,11	10	10,11	10	10,11	—	204 N. H.	Hottes

27b. Plant Physiology.—The response of the plant to external stimuli. *II*; (3).

Prerequisite: Botany 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	27b	3	Lecture	—	—	10	—	—	—	229 N. H.	Hottes
			Laboratory	10,11	—	10	—	10,11	—	204 N. H.	Hottes

Courses for Advanced Undergraduates and Graduates

Students who take courses open for credit to graduates are advised to register also for Botany 10a-10b, the weekly meeting devoted to current literature in botany, which is obligatory for candidates for an advanced degree with botany as a major subject.

Candidates for advanced degrees in botany must offer for admission to the graduate courses at least 20 hours of college work in botany, exclusive of Botany 1, and inclusive of courses 2a, 4a, 27a, or 27b and either 7a, 9b, 17a, or 17b, or equivalent.

Graduate students who elect botany for minor credit must offer the equivalent of 10 hours of college work in botany, exclusive of Botany 1, as a prerequisite to the courses listed for advanced undergraduates and graduates.

7b. Methods in the Study of Fungi.—Methods of isolation, cultivation, and inoculation of fungi and bacteria. *II*; (5). *Time to be arranged.*

Professor STEVENS

Prerequisite: Ten hours of botany, including Botany 7a; junior standing.

9a-9b. Plant Anatomy or Physiology.—Problems for those specializing either in anatomy with technique, or in physiology, or in the application of these to plant breeding, crop production, and forestry. *I, II*; *(3 or 5).

Prerequisite: 10 hours of botany, including Botany 3a; junior standing.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	9a	*3 or 5	Laboratory							6 or 10 hrs. (Arrange)	305 N. H. Hottes

SECOND SEMESTER

Botany	9b	*3 or 5	—	Schedule same as for 9a (first semester).							
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10a-10b. Current Botanical Literature.—A weekly review covering the field of botany; supplementary to the various seminar conferences. *I, II*; (1).

Prerequisite: Concurrent taking of some course in botany open for graduate credit.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	10a	1	—	—	—	—	—	4	—	229 N. H.	Trelease Hottes Stevens Hague McDougall

SECOND SEMESTER

Botany	10b	1	—	Schedule the same as for 1a (first semester).							
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16a-16b. Taxonomy of Algae and Bryophytes.—Advanced practise on selected groups. *I, II*; *(3 or 5).

Prerequisite: 10 hours of botany, including 2a or 4b; junior standing. For graduate students in chemistry, 5 hours of biology and 10 hours of physical science, including manipulation of instruments, or 15 hours of physical science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	16a	*3 or 5	Laboratory							6 or 10 hrs. (Arrange)	306 N. H. Hague

SECOND SEMESTER

Botany	16b	*3 or 5	—	Schedule the same as for 16a (first semester).							
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17a-17b. Taxonomy and Ecology of Cormophytes.—Advanced practise on selected taxonomic, ecological, or economic groups. Genera or families of Illinois plants, ecological association or adaptations, or plants economically important as weeds, forest resources, adjuncts to medicine, farm, orchard, or garden crops, or as the basis of floriculture, landscape architecture, street shading, or other decorative planting. *I, II*; *(3 or 5).

Prerequisite: 10 hours of botany, including Botany 4a; junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	17a	*3 or 5	Laboratory							6 or 10 hrs. (Arrange)	304 N. H. Trelease

SECOND SEMESTER

Botany	17b	*3 or 5	—	Schedule the same as for 17a (first semester).							
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22a. Morbid Histology.—The parasites of plant tissues and their histology in condition of disease. *I*; *(3 or 5).

Prerequisite: Botany 3a and 7a or 7b; junior standing.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Botany

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	22a	*3 or 5	Laboratory			6 or 10 hrs		(Arrange)		Botany Annex	Stevens

22b. Groups of Fungi and Crop Diseases.—

*II; *(3 or 5).*

Prerequisite: 10 hours of botany, including 7a or 7b; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	22b	*3 or 5	Laboratory			6 or 10 hrs.		(Arrange)		Botany Annex	Stevens

25a-25b. Plant Ecology.—Advanced studies in the ecology of plants or of plant communities. *I, II; *(3 or 5).*

Prerequisite: 10 hours of botany, including Botany 23; junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	25a	*3 or 5	Laboratory			6 or 10 hrs.		(Arrange)		304 N. H.	McDougall

SECOND SEMESTER

Botany 25b *3 or 5 Schedule the same as for 25a (first semester).

[26a-26b. Taxonomy of the Higher Fungi.—Advanced practise on selected groups. *I, II; *(3 or 5).* Not given in 1916-17.

Prerequisite: Botany 2a and 24; junior standing.]

28a-28b. Taxonomy of Economic Fungi.—Advanced practise on selected groups of parasitic fungi. *I, II; *(3 or 5).*

Prerequisite: 10 hours of Botany, including Botany 7a; junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	28a	3 or 5	Laboratory			6 or 10 hrs.		(Arrange)		Botany Annex	Stevens

SECOND SEMESTER

Botany 28b 3 or 5 Schedule the same as for 28a (first semester).

Courses for Graduates

101. Cytology.—The influence of external agents on the cell. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *I, II; (1/2 to 2 units).* Time to be arranged. Professor HOTTES

102. Physiology.—The effects of external stimuli on growth and movement. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *I, II; (1/2 to 2 units).* Time to be arranged. Professor HOTTES

104. Mycology.—Fungi. Individual assignments of subjects and problems in field and laboratory. *I, II; (1/2 to 2 units).* Time to be arranged. Professor STEVENS

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Business Organization and Operation

106. Plant Pathology.—Diseases of plants, and disease agents. Special subjects are assigned upon consultation. *I, II; (½ to 2 units). Time to be arranged.* Professor STEVENS

108. Taxonomy.—Monographic studies of critical groups. *I, II; (½ to 2 units.) Time to be arranged.* Professor TRELEASE

109. Ecology.—The interrelations of plants with their environment. Individual subjects for investigation. *I, II; (1½ to 2 units). Time to be arranged.* Dr. McDUGALL

BUSINESS LAW

(See BUSINESS ORGANIZATION AND OPERATION.)

BUSINESS ORGANIZATION AND OPERATION

(Including ACCOUNTANCY and BUSINESS LAW.)

LEWIS EMANUEL YOUNG, PH.D., *Assistant Professor*

ROBERT ENOCH HIERONYMUS, A.M., LL.D., *Community Adviser; lecturer on commercial and civic organizations*

HIRAM THOMPSON SCOVILL, A.B., *Instructor*

HARRISON MCJOHNSTON, A.M., *Instructor*

ANANIAS CHARLES LITTLETON, A.B., *Instructor*

CHARLES LE DEUC, LL.B., PH.D., B.A.M., *Instructor*

WILLIAM EVERETT BRITTON, A.M., J.D., *Instructor*

LLOYD MOREY, A.B., C.P.A., *Instructor*

GEORGE HILLIS NEWLOVE, A.M., *Assistant*

GEORGE BURR McMILLEN, A.B., *Assistant*

A. ACCOUNTANCY

Courses for Undergraduates

1a-1b. Principles of Accounting.—Principles of accounting and their application in the art of bookkeeping. Accounting procedure from single to double entry, illustrating the use of fundamental accounts and books. *Students who present one unit of bookkeeping for entrance will not be allowed credit for the first semester's work and should register for the second semester only.* Except in case of such students credit is not given for either semester separately. *I, II; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	1a	3	A, Lecture	1	—	—	—	—	—	100 Com.	Scovill
			B, Lecture	2	—	—	—	—	—	100 Com.	Scovill
			A, Practise	8,9	—	8,9	—	8,9	—	303 Com.	Le Deuc
			B, Practise	—	8,9	—	8,9	—	8,9	303 Com.	Le Deuc
			C, Practise	10,11	—	10,11	—	10,11	—	303 Com.	Le Deuc
			D, Practise	—	10,11	—	10,11	—	10,11	303 Com.	Littleton
			E, Practise	—	—	1,2,3	—	1,2,3	—	303 Com.	McMillen
			F, Practise	—	1,2,3	—	1,2,3	—	—	303 Com.	Newlove

SECOND SEMESTER

Accountancy 1b 3 Sections and schedule same as for 1a (first semester).

2a-2b. Advanced Accounting and Auditing.—Theory of partnership and corporation accounts, depreciation, goodwill, reserves and sinking funds; special

Business Organization and Operation

financial statements, reading balance sheets, illustrative problems. Credit is not given for either semester separately. *I, II; (3).*

Prerequisite: Accountancy 1a-1b; Economics 7 or 26, 22 or 27; registration or credit in Economics 1.

FIRST SEMESTER												
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>	
Accountancy	2a	3	A	8	—	8	—	8	—	210 Com.	Newlove	
			B	11	—	11	—	11	—	204 Com.	Littleton	
			C	1	—	1	—	1	—	111 Com.	Newlove	
			D	2	—	2	—	2	—	111 Com.	Littleton	
			E	2	—	2	—	2	—	308 Com.	Newlove	
			F	3	—	3	—	3	—	312 Com.	Scovill	
			G	3	—	3	—	3	—	308 Com.	Littleton	

SECOND SEMESTER

Accountancy 2b 3 Sections and schedule the same as for 2a (first semester).

3a-3b. Accounting Problems and Auditing.—Consolidated balance sheets; liquidation; the auditor's duties; schedules and reports. Credit is not given for either semester separately. *I, II; (3).*

Prerequisite: Accountancy 2a-2b; Economics 3; credit or registration in Business Organization and Operation 1.

FIRST SEMESTER												
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>	
Accountancy	3a	3	—	—	1	1	1	—	—	312 Com.	Scovill	

SECOND SEMESTER

Accountancy 3b 3 — Schedule the same as for 3a (first semester).

4a-4b. Cost Accounting.—(a) Cost accounting applied to factory procedure, overhead expense, the installation and control of cost systems, presentation of cost data; (b) as a basis for manufacturing efficiency; (c) the construction of cost systems. *I, II; (2).*

Prerequisite: Accountancy 2a-2b, Economics 1. For the current year, open also to juniors and seniors who have had Accountancy 1a-1b.

FIRST SEMESTER												
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>	
Accountancy	4a	2	—	—	8	—	8	—	—	307 Com.	Scovill	

SECOND SEMESTER

Accountancy 4b 2 — Schedule same as for 4a (first semester).

[5a-5b. C. P. A. Problems.—Representative problems of various types, including questions on theory and auditing. Credit is not given for either semester separately. *I, II; (2).* Not given in 1916-17.

Prerequisite: Accountancy 3a-3b.]

10. Shop Management and Shop Cost Records.—Cooperation between shop and cost departments; preparation and use of cost records; estimation of costs on contracts and calculation of profits. *II; (2).*

Prerequisite: Open only to students in engineering who have had Economics 1 or 2.

SECOND SEMESTER

<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>	
Accountancy	10	2	—	—	10	—	10	—	—	308 Com.	Scovill	

Business Organization and Operation

11. Farm Accounting.—The principles of accounting and distribution of costs as applied to farm operations; proper investment of funds. *I*; (3).

Prerequisite: Open only to students in agriculture who have had Economics 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	11	3	Discussion	—	—	—	—	1	—	312 Com.	Scovill
			Practice	—	2,3	—	2,3	—	—	202 Com.	McMillen

13a-13b. Municipal and Institutional Accounting.—Budget making; appropriations; warrants; taxes; special assessments; system building; functional organization; control; reports; auditing. The second semester's work may be taken without the first only on the approval of the instructor. *I, II*; (2).

Prerequisite: Accountancy 2a-2b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	13a	2	—	—	2	—	2	—	—	307 Com.	Morey

SECOND SEMESTER											
Accountancy	13b	2	Sections and schedule the same as for 13a (first semester).								

B. BUSINESS ORGANIZATION AND OPERATION

Courses for Undergraduates

1. Business Organization and Operation.—Individual proprietorship, partnership, and cooperation; the process of organizing a business; organization for operation and the reaction of form of organization on efficiency; gradation and interrelation of divisions and departments; departmental responsibility and authority, routine, and discipline. *I*; (3).

Prerequisite: Economics 1 and Accountancy 2a-2b. For the present year students who have had Accountancy 1a-1b may be admitted on application to the instructor.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	1	3	A, Lecture	—	—	11	—	—	—	100 Com.	} Young
			B, Lecture	—	—	2	—	—	—	100 Com.	
			A ¹ , Quiz	11	—	—	—	11	—	312 Com.	
			A ² , Quiz	—	11	—	11	—	—	312 Com.	
			B ¹ , Quiz	2	—	—	—	2	—	312 Com.	
			B ² , Quiz	—	2	—	2	—	—	312 Com.	

2. Organization and Control of Mercantile Distribution.—Problems of organization and management of wholesale and retail establishments. Supervision and control of mercantile distribution by business associations, by consumers, and by political units. *II*; (2).

Prerequisite: Business Organization and Operation 1; Economics 28.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	2	2	A	—	11	—	11	—	—	312 Com.	Young
			B	—	2	—	2	—	—	312 Com.	Young

[3. Business Procedure.—Conventional business practises; cash and trade discounts; commissions; interest and discounts: forms and uses of checks,

Business Organization and Operation

notes, drafts, and other instruments of credit and exchange; the rules and procedure of banking institutions; mercantile and credit agencies. Office organization and management. *I*; (2). Not given in 1916-17.

Prerequisite: Business Organization and Operation 2.]

7. Salesmanship.—Policies and practise of modern sales organizations; selling problems of manufacturers, wholesalers, and retailers, management of salesmen; the practise of individual salesmen. *I*; (2).

Prerequisite: Economics 1; Business Organization and Operation 1. For the present year former Economics 6 will be accepted in place of Business Organization and Operation 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	7	2	—	8	—	8	—	—	—	312 Com.	McJohnston

8. Advertising.—Principles and current practise; cooperation of advertising and personal selling; special problems; planning sales campaigns; choice of media; space buying; and practice in writing copy. *II*; (2).

Prerequisite: Business Organization and Operation 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	8	2	—	8	—	8	—	—	—	312 Com.	McJohnston

9. Commercial and Civic Organizations.—For students preparing for positions as secretaries of commercial or agricultural associations, civic or welfare clubs, and similar organizations. The history of trade and similar organizations; methods of organization; expansion and promotion; the relation of such association to the life and welfare of the community and to one another; promotion of community welfare by common action; work and duties of the secretary and other officers; the legal status and recent results. *II*; (1).

Prerequisite: Economics 1; Business Organization and Operation 2 or Economics 28; or Economics 2 and Farm Management 1; or Economics 1, Political Science 4, and Sociology 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	9	1	—	11	—	—	—	—	—	308 Com.	Hieronymus

10. Organization and Operation of Newspaper Publishing.—Designed primarily for students specializing in journalism. Growth of the industry in the United States; number, kinds, and distribution of newspapers; national organization of the industry; tendency towards large scale production; buying and selling practises; methods of securing and handling advertising; systems of gaining and holding circulation; cost accounting and office systems; mechanical organization and equipment; shop management and labor problems. *II*; (2).

Prerequisite: Economics 1; junior standing.

Business Organization and Operation

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	10	2	—	—	3	—	3	—	—	312 Com.	Russell

Course for Undergraduates and Graduates

4. Industrial Organization and Management.—Problems of organization and of administrative policy; supervision and management of industries and industrial units. Relations to labor, the community and law. *II; (2).*

Prerequisite: Business organization and Operation 2. For the present year Economics 10 and Accountancy 1a-1b will be accepted instead of Business Organization and Operation 2. Senior engineering students who have had Economics 1 or 2 may be admitted by permission of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	4	2	—	—	10	—	10	—	—	312 Com.	Young

Courses for Graduates

101. Regulation and Control of Mercantile Distribution.—Federal, state, and local regulation of mercantile business; unfair competition; trade agreements; trade mark; inspection of mercantile establishments; pure food acts; control over weights and measures, packing, storage, and shipment. *Twice a week; I; (1 unit). Time to be arranged.* Assistant Professor YOUNG

[102. Scientific Management.—The history of the scientific management movement; critical study of the proposed systems; results of the application of scientific principles in the management of various types of business enterprise. *Twice a week; I, II; (1 unit).* Not given in 1916-17.

Assistant Professor YOUNG]

C. BUSINESS LAW

Courses for Undergraduates

1a-1b. Commercial Law.—Principles underlying the law of contracts, negotiable instruments, agency, partnerships, business corporations, sales of personal property, bailments and carriers, guaranty and suretyship, and insurance. *I, II; (3).*

Prerequisite: Sixty hours of university credit, including Economics 1 and Accountancy 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Law	1a	3	A	8	—	8	—	8	—	307 Com.	Britton
			B	2	—	2	—	2	—	307 Com.	Britton
			C	3	—	3	—	3	—	307 Com.	Britton

SECOND SEMESTER

Business Law 1b 3 Schedule and sections the same as for 1a (first semester).

2. Elementary Law.—Contracts; leases; landed property. Open to junior and senior students in agriculture only. *II; (3).*

Prerequisite: Economics 1 or 2.

Ceramic Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Law	2	3	—	1	—	1	—	1	—	307 Com.	Britton

3. Business Law.—The law of contracts, negotiable instruments, agency, partnerships, corporations, sales of personal property, bailments and carriers, guaranty and suretyship, insurance, real property, and landlord and tenant. Open to junior and senior students in engineering only. *II*; (3).

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Law	3	3	—	10	—	10	—	10	—	312 Com.	Young

CELTIC

(See ENGLISH.)

CERAMIC ENGINEERING

EDWARD WIGHT WASHBURN, PH.D., *Professor, Ceramic Chemistry*

RALPH KENT HURSH, B.S., *Assistant Professor*

HOWARD C. ARNOLD, *Instructor*

The courses offered by the department of ceramic engineering are designed to give a technical knowledge of the composition and properties of materials used in the manufacture of claywares, cements, glasses, and enamels, and to acquaint the student with the construction, equipment, and operation of ceramic plants.

Graduates of courses other than ceramic engineering who have the necessary prerequisites may take the following courses for minor credit: 3, 5, 6, 8, 10, 13, 14, 15, and 16.

Courses for Undergraduates

1. Ceramic Materials.—The properties of clays and other ceramic materials; the identification of the varieties met in practical work. Lectures; laboratory. *I*; (3).

Prerequisite: Chemistry 5a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	1	3	—	1	—	1-4	—	1-4	—	Cer.	—

2. Winning and Preparation of Clays.—Machinery and processes used in preparing clays for market or manufacture; cost data. *I*; (3).

Prerequisite: Chemistry 5a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	2	3	—	8	—	8	—	8	—	Cer.	—

3. Industrial Calculations.—Chemical and physical calculations applying to the operation of furnaces, kilns, and dryers; temperature measurements; ceramic stoichiometry. *II*; (3).

Prerequisite: Ceramic Engineering 1, 2; Physics 1a-1b and 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	3	3	—	10	—	10	—	10	—	Cer.	—

4 Drying and Burning.—Clay wares; types of construction of industrial dryers and kiln plants; chemical and physical processes involved. *I*; (4).

Prerequisite: Ceramic Engineering 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	4	4	—	9	9	9	9	—	—	Cer.	—

5. Ceramic Bodies.—Composition and properties of ceramic body mixtures; effects of various ingredients; development of special bodies. Lectures; laboratory. *II*; (5).

Prerequisite: Ceramic Engineering 1, 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	5	5	Lecture	9	—	9	—	9	—	Cer.	—
			Laboratory	1-4	—	1-4	—	—	—	Cer.	—

6. Glazes.—Production of glazes and enamels; limits of composition; classification; properties and defects common to each class; effect of variation in composition; modes of application. Lectures; laboratory. *I*; (5).

Prerequisite: Ceramic Engineering 3, 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	6	5	Lecture	—	10	—	10	—	—	Cer.	—
			Laboratory	—	1-4	—	1-4	—	9-12	Cer.	—

8. Glass.—Raw materials, preparation, compounding, melting, and shaping; chemical principles involved in the manufacture and decoration of the various types of vitreous silicates. Lectures. *II*; (2).

Prerequisite: Ceramic Engineering 6.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	8	2	—	8,9	—	8,9	—	—	—	Cer.	—

9. Ceramic Construction.—Plans, specifications, and estimates for ceramic equipments and industrial plants. *II*; (4).

Prerequisite: General Engineering Drawing 2; Ceramic Engineering 3, 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	9	4	—	1-4	1-4	1-4	1-4	—	—	Cer.	—

10. Cements.—Cements, limes, plasters; composition; reactions; methods of manufacture and testing. *I*; (3).

Prerequisite: Ceramic Engineering 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Cer. E.	10	3	—				(Arrange)			Cer.	—

Chemistry

11. Thesis.—II; (3).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	11	3	—							Cer.
								(Arrange)		

12. Designing and Shaping.—Die construction; templates; master and working molds for pressing, casting, and jigging. II; (3).

Prerequisite: Ceramic Engineering 1, 2.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	12	3	Lecture	—	—	—	—	11	—	Cer.
			Laboratory	—	—	—	—	1-4	9-12	Cer.

17. Silicates.—Formation and properties; experimental methods. I; (3).

Prerequisite: Ceramic Engineering 3, 5.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	17	3	—	2-5	11	—	11	—	—	Cer.
										Washburn

99. Inspection Trip.—Visits to industrial plants representative of various phases of ceramic work. I; (no credit). *Time to be arranged.*

Prerequisite: Senior standing.

Courses for Graduates

Registration in graduate courses in ceramic engineering presupposes full undergraduate work in the subject, or sufficient training in allied subjects to warrant the expectation that the student will be able to do the work elected.

101. The Formation of Silicates.—Theoretical principles involving the conceptions of physical chemistry; thermal studies. I; (1 to 2 units). *Time to be arranged.*

102. Technology of the Clay Industries.—Mineralogical constitution of clays; plasticity and the colloidal state; pyro-chemical and physical changes; composition and constitution of bodies, glazes, and enamels. II; (1 to 2 units). *Time to be arranged.*

103. Technology of Cements.—Composition and constitution; hydration and dehydration of cementing compounds; action of catalyzers. II; (1 to 2 units). *Time to be arranged.*

104. Technology of Glass.—Fusion studies of glassy silicates; limiting compositions; physical and chemical properties of glasses. II; (1 to 2 units). *Time to be arranged.*

CHEMISTRY

WILLIAM ALBERT NOYES, PH.D., LL.D., *Professor and Director*

SAMUEL WILSON PARR, M.S., *Professor*

HARRY SANDS GRINDLEY, D.Sc., *Professor*

EDWARD BARTOW, PH.D., *Professor*

RICHARD CHACE TOLMAN, PH.D., *Professor*

DAVID FORD MCFARLAND, PH.D., *Associate Professor*

GEORGE MCPHAIL SMITH, PH.D., *Assistant Professor*

HENRY CHARLES PAUL WEBER, PH. D., *Assistant Professor*

DUNCAN ARTHUR MACINNES, PH. D., *Associate*

GEORGE DENTON BEAL, PH.D., *Associate*
 B SMITH HOPKINS, PH.D., *Associate*
 HOWARD BISHOP LEWIS, PH.D., *Associate*
 HENRY JOHN BRODERSON, PH.D., *Instructor*
 GEORGE WALLACE SEARS, PH.D., *Instructor*
 HERBERT E. EASTLACK, PH.D., *Instructor*
 JESSIE YEREANCE CANN, PH.D., *Instructor*
 OLIVER KAMM, PH.D., *Instructor*
 GERARD VAN ROSSEN, PH.D., *Instructor*
 FLOYD WILLIAM MOHLMAN, PH.D., *Instructor*
 EDGAR WALLACE ENGLE, PH.D., *Instructor*
 THEODORE ROLLY BALL, PH.D., *Instructor*
 FREDERICK OSBAND ANDEREGG, PH.D., *Research Assistant*
 SCOTT CHAMPLIN TAYLOR, M.S., *Assistant*
 LLOYD BRELSFORD HOWELL, A.B., *Assistant*
 HARRY CLEVELAND KREMERS, M.S., *Assistant*
 EDWIN ARTHUR REES, A.M., *Assistant*
 GLENN SEYMOUR SKINNER, A.M., *Assistant*
 JAY THOMAS FORD, M.S., *Assistant*
 TERRENCE ONAS WESTHAEFER, M.S., *Assistant*
 DON WARREN BISSELL, M.S., *Assistant*
 WALTER GERALD KARR, M.S., *Assistant*
 ERNEST HENRY VOLLWEILER, A.M., *Assistant*
 FRANK F FOOTITT, M.S., *Assistant*
 ALBERT WAFFLE OWENS, B.S., *Assistant*
 FLOYD ELBA ROWLAND, A.M., *Assistant*
 WILLIAM ALEXANDER VANWINKLE, B.S., *Assistant*
 JOHN FREDERICK GROSS HICKS, M.S., *Assistant*
 HENRY JOSEPH WEILAND, M.S., *Assistant*
 HARRY JAMES BEATTIE, A.M., *Assistant*
 RALPH EMERSON RINDFUSZ, A.M., *Assistant*
 ALFRED RICHARD POWELL, A.M., *Assistant*
 JOSEPH MARVIN BRAHAM, M.S., *Research Assistant*
 PAUL ANDERS, *Assistant, Glass Blowing*
 LANSING SADLER WELLS, B.S., *Assistant*
 HENRY RHODES LEE, M.S., *Graduate Assistant*
 JAMES KEEL REED, A.B., *Graduate Assistant*
 RUTH ELIZA OKEY, M.S., *Graduate Assistant*
 HERBERT AUGUST WINKELMANN, B.S., *Graduate Assistant*
 LEONARD FRANCIS YNTEMA, A.B., *Graduate Assistant*
 RALPH WILLIAM HUFFORD, A.B., *Graduate Assistant*
 HELEN UPDEGRAFF, B.S., *Graduate Assistant*
 WILLIAM ROBERT BRUCE, A.B., *Graduate Assistant*
 LOUIS JORDAN, A.B., *Graduate Assistant*
 MARGARET CAMPBELL PERRY, A.B., *Graduate Assistant*
 JOHN BERNIS BROWN, B.S., *Graduate Assistant*
 JAMES HARRIS OLEWINE, B. S., *Graduate Assistant*
 HERBERT EPHRAIM FRENCH, A.B., *Graduate Assistant*
 CARL SHIPP MARVEL, A.M., *Graduate Assistant*
 SARGENT GASTMAN POWELL, M.S., *Graduate Assistant*
 CECIL WAYNE BOYLE, A.B., *Graduate Assistant*

Chemistry

WILLIAM LIONEL MCCLURE, A.B., *Graduate Assistant*

OTTO M SMITH, B.S., *Graduate Assistant*

Cooperating:

FRED WEAVER MUNCIE, PH.D., *Associate in Floricultural Chemistry*

Major: 20 hours, exclusive of chemistry 1, 1a, 1b, 4 and 16, and inclusive of courses in quantitative analysis and organic chemistry.

Minors: 20 hours, chosen from bacteriology, botany, geology, mathematics, philosophy, physiology, physics, and zoology.

Students taking chemistry at the University are advised to give at least one year to the subject, and this should include Chemistry 1 or 1a, 2a or 3a. Those continuing in the second year should take Chemistry 5a and 5b, or 13a and 25. In the third year Chemistry 14a, 14b, or 9, 9a, and 9b, or 9c, 31, and 33 should be taken. With these, more special courses may be taken if desired, but students are not advised to take the special courses unless they have had the fundamental work represented by the selection given above. Students who desire a training for professional work in chemistry, either as teachers or in its industrial applications, should take the curriculum in chemistry, or in chemical engineering.

Students who find it impossible to take more than one semester's work are requested to register for Chemistry 1 or 1a in the second semester rather than in the first.

1. Inorganic Chemistry.—The non-metallic elements. Noyes: *Text-book of Chemistry. I or II; (5).*

NOTE: Students who have credit for high school chemistry should register for chemistry 1a.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	1	5	A, Lecture	—	11	—	11	—	100 Ch.	Noyes
			B, Lecture	—	2	—	2	—	100 Ch.	Hopkins
			A, Quiz	8	—	8	—	—	103 Ch.	Hopkins Sears Cann Engle and Assistants
			†B, Quiz.	11	—	11	—	—	103 Ch.	
			C, Quiz	2	—	2	—	—	103 Ch.	
			D, Quiz	—	8	—	8	—	103 Ch.	
			E, Quiz	—	10	—	10	—	103 Ch.	
			F, Quiz	—	1	—	1	—	103 Ch.	
			A, Laboratory	8,9	—	8,9	—	8,9	350 Ch.	
			B, Laboratory	10,11	—	10,11	—	10,11	350 Ch.	
			C, Laboratory	—	10,11	—	10,11	—	350 Ch.	
			D, Laboratory	1,2	—	1,2	—	1,2	305,350 Ch.	
			Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
			Lecture	—	11	—	11	—	100 Ch.	Hopkins
			A, Quiz	11	—	11	—	—	116 Ch.	Hopkins Sears
			B, Quiz	1	—	1	—	—	116 Ch.	
			C, Quiz	—	8	—	8	—	116 Ch.	
			D, Quiz	—	10	—	10	—	116 Ch.	
			A, Laboratory	8,9	—	8,9	—	8,9	308 Ch.	
			B, Laboratory	10,11	—	10,11	—	10,11	308 Ch.	
			C, Laboratory	—	1,2,3	—	1,2,3	—	308 Ch.	

1a. Inorganic Chemistry.—Lectures; recitations; laboratory. For students who have had one year of high school chemistry. *I or II; (3).*

Prerequisite: One year of entrance chemistry. Students whose preparation proves to be inadequate for continuing this course will be required to change their registration to Chemistry 1.

†Students in chemistry and chemical engineering must enroll in this section.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1a	3	C, Lecture	—	9	—	—	—	—	100 Ch.	Hopkins
			D, Lecture	—	10	—	—	—	—	100 Ch.	Hopkins
			G, Quiz	9	—	9	—	—	—	111 Ch.	Hopkins
			H, Quiz	10	—	—	—	10	—	111 Ch.	
			†I, Quiz	11	—	11	—	—	—	111 Ch.	
			J, Quiz	11	—	—	—	11	—	217 Ch.	
			K, Quiz	3	—	3	—	—	—	111 Ch.	
			L, Quiz	—	8	—	8	—	—	111 Ch.	
			M, Quiz	—	10	—	10	—	—	217 Ch.	
			N, Quiz	—	1	—	1	—	—	217 Ch.	
			O, Quiz	—	—	8	—	8	—	111 Ch.	
			P, Quiz	—	—	1	—	1	—	111 Ch.	
			E, Laboratory	8,9	—	—	—	—	—	308 Ch.	
			F, Laboratory	—	10,11	—	—	—	—	450 Ch.	
			G, Laboratory	—	—	—	8,9	—	—	308 Ch.	
			H, Laboratory	—	—	—	10,11	—	—	450 Ch.	
			I, Laboratory	—	—	—	—	8,9	—	308 Ch.	
			J, Laboratory	—	—	—	—	—	10,11	308 Ch.	
			K, Laboratory	1,2	—	—	—	—	—	467 Ch.	
			L, Laboratory	—	1,2	—	—	—	—	467 Ch.	
			M, Laboratory	—	3,4	—	—	—	—	467 Ch.	
			N, Laboratory	—	—	1,2	—	—	—	450 Ch.	
			O, Laboratory	—	—	—	1,2	—	—	308 Ch.	
			P, Laboratory	—	—	—	3,4	—	—	467 Ch.	
			Q, Laboratory	—	—	—	—	1,2	—	467 Ch.	

SECOND SEMESTER

Lecture	—	—	—	—	11	—	100 Ch.	Hopkins
E, Quiz	10	—	10	—	—	—	103 Ch.	Hopkins
F, Quiz	11	—	11	—	—	—	103 Ch.	
G, Quiz	—	10	—	10	—	—	103 Ch.	
E, Laboratory	—	8,9	—	—	—	—	308 Ch.	
F, Laboratory	—	—	—	10,11	—	—	308 Ch.	
G, Laboratory	—	—	—	—	—	8,9	308 Ch.	
H, Laboratory	—	—	—	—	—	10,11	308 Ch.	
I, Laboratory	—	—	—	1,2	—	—	308 Ch.	

1b. Inorganic Chemistry.—Lectures; recitations; laboratory. (For students in engineering.) *I* or *II*; (4).

NOTE: Students who have credit for high school chemistry should register for chemistry 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1b	4	A, Lecture	—	11	—	11	—	—	100 Ch.	Noyes
			B, Lecture	—	2	—	2	—	—	100 Ch.	Hopkins
			R, Quiz	9	—	9	—	—	—	201 Ch.	Hopkins
			S, Laboratory	8-11	—	—	—	—	—	201 Ch.	
			T, Quiz	11	—	—	—	11	—	201 Ch.	
			U, Quiz	—	—	8	—	8	—	459 Ch.	
			V, Quiz	—	—	1	—	1	—	201 Ch.	
			R, Laboratory	8-11	—	—	—	—	—	467 Ch.	
			S, Laboratory	—	—	—	8-11	—	—	467 Ch.	
			T, Laboratory	—	—	—	—	8-11	—	467 Ch.	
			U, Laboratory	—	—	—	—	—	8-11	467 Ch.	
			V, Laboratory	—	—	—	—	—	9-12	467 Ch.	
			W, Laboratory	1-4	—	—	—	—	—	467 Ch.	
			X, Laboratory	—	—	1-4	—	—	—	467 Ch.	
			Y, Laboratory	—	—	—	1-4	—	—	467 Ch.	
			Z, Laboratory	—	—	—	—	1-4	—	467 Ch.	

†Students in chemistry and chemical engineering must enroll in this section.

Chemistry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1b	4	Lecture	—	11	—	11	—	—	100 Ch.	Hopkins
			L, Quiz	11	—	11	—	—	—	111 Ch.	Hopkins Sears
			M, Quiz	—	10	—	10	—	—	111 Ch.	
			L, Laboratory	—	8-11	—	—	—	—	308 Ch.	
			M, Laboratory	—	—	1-4	—	—	—	308 Ch.	
			N, Laboratory	—	—	—	1-4	—	—	308 Ch.	

2a. Inorganic Chemistry and Qualitative Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Lectures; recitations; laboratory. *I or II*; (5).

Prerequisite: Chemistry 1 or 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	2a	5	Lecture	—	—	9	—	9	—	100 Ch.	Weber
			A, Quiz	—	9	—	9	—	—	201 Ch.	Weber Hopkins Sears Engle
			B, Quiz	—	11	—	11	—	—	201 Ch.	
			C, Quiz	—	—	8	—	8	—	201 Ch.	
			A, Laboratory	—	8,9	—	8,9	—	8,9	305 Ch.	
			B, Laboratory	10,11	—	10,11	—	10,11	—	305 Ch.	

SECOND SEMESTER

A, Lecture	—	9	—	9	—	—	100 Ch.	Weber
B, Lecture	—	10	—	10	—	—	100 Ch.	Weber
A, Quiz	8	—	8	—	—	—	201 Ch.	Weber Hopkins Sears Cann Engle
B, Quiz	10	—	10	—	—	—	201 Ch.	
C, Quiz	11	—	11	—	—	—	201 Ch.	
D, Quiz	—	8	—	8	—	—	201 Ch.	
E, Quiz	—	10	—	10	—	—	201 Ch.	
F, Quiz	—	11	—	11	—	—	201 Ch.	
G, Quiz	—	1	—	1	—	—	201 Ch.	
H, Quiz	—	2	—	2	—	—	201 Ch.	
I, Quiz	—	3	—	3	—	—	201 Ch.	
J, Quiz	—	—	9	—	9	—	204 Ch.	
K, Quiz	—	—	1	—	1	—	201 Ch.	
A, Laboratory	8,9	—	8,9	—	8,9	—	305 Ch.	
B, Laboratory	—	8,9	—	8,9	—	8,9	350 Ch.	
C, Laboratory	10,11	—	10,11	—	10,11	—	305 Ch.	
D, Laboratory	1,2	—	1,2	—	1,2	—	305 Ch.	
E, Laboratory	—	1,2	—	1,2	—	10,11	350 Ch.	

3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. *I or II*; (6).

Prerequisite: Chemistry 1 or 1a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	3a	6	Lecture	—	—	9	—	9	—	100 Ch.	Weber
			Quiz	—	—	8	—	8	—	303 Ch.	
			Laboratory	1-4	—	1-4	—	1-4	—	305 Ch.	

SECOND SEMESTER

Lecture	—	10	—	10	—	—	100 Ch.	Weber
Quiz	10	—	10	—	—	—	303 Ch.	
Laboratory	1,4	—	1,4	—	1,4	—	350 Ch.	

4. Qualitative Analysis and Chemistry of the Metallic Elements.—Class and laboratory work. (For students in engineering.) *I or II*; (4).

Assistant Professor WEBER in charge.

Prerequisite: Chemistry 1a or 1b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	4	4	A, Quiz	3	—	—	—	3	—	303 Ch.	Weber Cann Sears Engle
			B, Quiz	—	8	—	8	—	—	303 Ch.	
			C, Quiz	—	11	—	11	—	—	303 Ch.	
			A, Laboratory	—	1-4	—	1-4	—	—	305 Ch.	
			B, Laboratory	—	—	1-4	—	1-4	—	305 Ch.	

SECOND SEMESTER									
A, Quiz	8	—	8	—	—	—	303 Ch.	Weber Cann Sears Engle	
B, Quiz	9	—	9	—	—	—	303 Ch.		
C, Quiz	10	—	10	—	—	—	116 Ch.		
D, Quiz	11	—	11	—	—	—	204 Ch.		
E, Quiz	2	—	2	—	—	—	204 Ch.		
F, Quiz	—	9	—	9	—	—	204 Ch.		
G, Quiz	—	10	—	10	—	—	204 Ch.		
H, Quiz	—	11	—	11	—	—	204 Ch.		
I, Quiz	—	2	—	2	—	—	204 Ch.		
A, Laboratory	8,9	—	8,9	—	8,9	—	467 Ch.		
B, Laboratory	—	8,9	—	8,9	—	8,9	467 Ch.		
C, Laboratory	—	10,11	—	10,11	—	10,11	467 Ch.		
D, Laboratory	1-4	—	—	—	1-4	—	467 Ch.		
E, Laboratory	—	1-4	—	1-4	—	—	467 Ch.		

5a. Elementary Quantitative Analysis.—Gravimetric and volumetric analysis; stoichiometrical relations and the application of the fundamental laws of chemistry to quantitative analysis. Lectures; recitations; laboratory. Talbot: *Quantitative Chemical Analysis*. I or II; (5).

Assistant Professor SMITH in charge.

Prerequisite: Chemistry 2a, or 3a, or 4.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	5a	5	Lecture or Quiz	9	—	9	—	—	—	100 Ch.	Smith
			A, Laboratory	—	1-4	—	1-4	—	8-12	218 Ch.	Smith
			B, Laboratory	1-4	—	1-4	—	1-4	—	260 Ch.	Smith

SECOND SEMESTER								
Lecture	—	9	—	9	—	—	217 Ch.	Eastlack
Laboratory	—	1-4	—	1-4	—	8-12	216 Ch.	Eastlack

5b. Quantitative Analysis.—(Continuation of 5a.) Analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; recitations; laboratory. Treadwell-Hall: *Analytical Chemistry*, Vol. II. II; (5).

Prerequisite: Chemistry 5a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5b	5	Lecture	—	9	—	9	—	—	217 Ch.	Smith
			Laboratory	—	1-4	—	1-4	—	8-12	260 Ch.	Smith

NOTE.—For Chemistry 5c, see Chemistry 25.

5d. Elementary Quantitative Analysis.—A modification of chemistry 5a. (For Mining Engineers only.) I; (4).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5d	4	Recitation	—	9	—	—	—	—	111 Ch.	Smith
			Laboratory	—	1-4	—	1-4	—	8-12	218 Ch.	Smith

Chemistry

6†. Chemical Technology.—Technological chemistry as illustrated in those industries having a chemical basis for their principal operations and processes; trade journals. Lectures; recitations. Rogers and Aubert: *Industrial Chemistry. II*; (3).

Prerequisite: Chemistry 5a and 14a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	6	3	—	11	—	11	—	11	—	161 Ch.	McFarland

7†. Metallurgy.—General metallurgy; metallurgy of iron and steel. Lectures; assigned reading; recitations. Fulton's *Principles of Metallurgy*; Stoughton's *Iron and Steel. I*; (3).

Prerequisite: Chemistry 5a. (Senior students in engineering courses may be admitted to this course by special arrangement, without this prerequisite.)

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	7	3	A	11	—	11	—	11	—	161 Ch.	McFarland
			*B	8	—	8	—	8	—	161 Ch.	McFarland

7a. Metallurgy of the Non-Ferrous Metals.—Copper, lead, zinc, gold, and silver. *II*; (3).

Prerequisite: Chemistry 5a or 13a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	7a	3	—	—	8	—	8	—	8	161 Ch.	McFarland

9. Organic Chemistry.—Characteristics of the more typical and simple organic compounds; the important classes of derivatives of carbon. (For students of the medical preparatory and household science curriculums and others desiring a short course.) *II*; (3).

Prerequisite: Chemistry 2a or 3a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9	3	—	8	—	8	—	8	—	217 Ch.	—

9a. Organic Synthesis and Ultimate Analysis.—Ultimate organic analysis; preparation of typical organic compounds. Laboratory. *I* or *II*; (2).

Prerequisite: Registration in Chemistry 14a, or equivalent.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9a	2	A	1,2,3	—	1,2,3	—	—	—	250 Ch.	} Kamm
			B	—	1,2,3	—	1,2,3	—	—	250 Ch.	

9b. Organic Synthesis and Qualitative Organic Analysis.—Continuation of 9a, to accompany Chemistry 14b. *I* or *II*; (2).

Prerequisite: Chemistry 9a, 14a; registration in Chemistry 14b, or equivalent.

*For senior students in Engineering only.

†Certain required inspection trips will be arranged in connection with courses 6 and 7. Students registered in these courses should take into consideration the expense involved, which will approximate \$15.00 for each course.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9b	2	—	1-4	—	1-4	—	—	—	250 Ch.	Kamm

9c. Organic Synthesis.—Typical organic compounds. Laboratory. (For students in the medical preparatory and household science curriculums and others desiring a brief course.) *I* or *II*; (2).

Prerequisite: Chemistry 2a or 3a; registration in Chemistry 9, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	9c	2	—	—	1-4	—	1-4	—	—	250 Ch.	Kamm

10a. Water Chemistry.—History, sources, contamination, and standards of purity of potable waters and waters for industrial purposes. Lectures; practise in analytical methods. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	10a	3	—	—	1-4	—	1-4	—	8-11	60-B Ch.	Bartow Mohlman

10b. Chemistry of Water and Sewage.—The chemical analysis of potable waters and waters for industrial purposes. Lectures on the history, sources, contamination, and standards of purity. Chemical analysis of sewage and effluents from sewage treatment plants, for students in sanitary engineering, registered in connection with Bacteriology 6. *I*; (2½).

Prerequisite: Chemistry 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	10b	2½	—	2-4	10,11	2-4	10,11	10,11	—	60-B Ch.	Bartow Mohlman

11a-11b. Thesis.—Thesis, embodying a review of the literature of the subject; account of work done in the laboratory. The subject should be determined upon and reading begun in the junior year. A minimum of five semester hours is required. (Required of seniors in chemistry and chemical engineering.) *I, II*; (5).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	11a	5	—					(Arrange)			Noyes in charge

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	11b	5	—					(Arrange)			Noyes in charge

13a. Elementary Quantitative Analysis.—Gravimetric and volumetric analysis, fertilizer and milk analysis. Lectures; recitations; laboratory. Talbot's *Quantitative Chemical Analysis*. (For students in agriculture.) *I* or *II*; (5).

Assistant Professor SMITH in charge.

Prerequisite: Chemistry 2a, or 3a.

Chemistry

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	13a	5	Lecture	—	—	11	—	—	—	100 Ch.	Beal
			A, Lab. & Quiz	8-11	—	8-11	—	8-11	—	218 Ch.	} Beal Eastlack
			B, Lab. & Quiz	—	8-12	—	8-12	—	8	218 Ch.	
			C, Lab. & Quiz	—	1-4	—	1-4	—	8-11	260 Ch.	
SECOND SEMESTER											
Chemistry	13a	5	Lecture	—	—	11	—	—	—	100 Ch.	Eastlack
			A, Lab. & Quiz	8-11	—	8-11	—	8-11	—	218 Ch.	} Beal Eastlack
			B, Lab. & Quiz	—	8-12	—	8-12	—	8	260 Ch.	
			C, Lab. & Quiz	1-4	—	1-4	—	1-4	—	260 Ch.	

13b. Advanced Agricultural Analysis.—Special methods in agricultural analysis; theory of the determinations; preparation of solutions; sampling; calculations. Treadwell: *Analytical Chemistry*, Vol. II. II; (5).

Prerequisite: Chemistry 5a or 13a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	13b	5	Lecture	1	—	1	—	—	—	161 Ch.	Beal
			Laboratory 2,3	—	—	2,3	—	1-4	—	216 Ch.	Beal

14a-14b. Organic Chemistry.—Lectures; recitations. Noyes: *Organic Chemistry*. I; (4); II; (2). "

Prerequisite: Chemistry 5a; should be accompanied by Chemistry 9a and 9b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	14a	4	—	9	9	9	9	—	—	217 Ch.	Noyes
SECOND SEMESTER											
Chemistry	14b	2	—	9	—	9	—	—	—	217 Ch.	Noyes

15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic-digestion; intestinal digestion; bile; putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these topics treated thoroughly for prospective students of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Mathews: *Physiological Chemistry*; Hawk: *Practical Physiological Chemistry*. (Open to graduates and undergraduates.) I; (5).

Prerequisite: Two years' work in chemistry, including Chemistry 14a-14b and 9a, or 9 and 9c.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15	5	Lecture	2	—	2	—	—	—	459 Ch.	Lewis
			Laboratory	—	1-4	—	1-4	1-4	—	450 Ch.	—

15a. Problems of Metabolism.—(Especially for medical students.) Colloids; animal oxidations; osmosis; absorption; selective activity of cells; metabolism; activities of gastro-intestinal tract; enzymes; inorganic nutrition. Lectures; demonstrations; conferences. II; (2).

Prerequisite: Chemistry 15.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15a	2	—	9	—	—	—	—	9	459 Ch.	Lewis

16. Chemistry for Engineers.—The proximate analysis of coal; determination of calorific power; technical analysis of furnace gases; examination of boiler waters; lubricating oils. (For students in engineering.) *II*; (3).

Prerequisite: Chemistry 4; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	16	3	Lecture	—	—	—	—	8	—	111 Ch.	Parr
			A, B, Laboratory	—	1-4	—	1-4	—	—	125 Ch.	Broderson
			C, Laboratory	—	—	—	8-11	—	8-11	125 Ch.	

21. Qualitative Organic Analysis.—Systematic methods for identification of pure organic compounds and mixtures. *I* or *II*; (2).

Prerequisite: Chemistry 9a, 9b.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	21	2	A	—	1-4	—	1-4	—	—	219 Ch.	} Kamm
			B	1-4	—	1-4	—	—	—	219 Ch.	

22. Animal Chemistry (Animal Nutrition).—The chemical composition of animal products and feeding stuffs. Lectures; conferences; assigned reading; laboratory. *I* or *II*; (5).

Prerequisite: Two years' work in chemistry.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	22	5	—	—	—	—	—	—	—	558 Ag.	Grindley

(Arrange)

†**25. Food Analysis.**—Quantitative organic analysis, with special reference to the examination of food products: alcohols, carbohydrates, fats and oils, cereals, nitrogenous bodies, preservatives, and colors. Sherman: *Organic Analysis and Food Products*. *I*; (5).

Prerequisite: Chemistry 5a or 13a; 9 or 14a-14b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	25	5	Lecture	—	10	—	10	—	10	111 Ch.	Beal
			Laboratory	1,2,3	—	1,2,3	—	1,2,3	—	216 Ch.	Beal

27. Qualitative Analysis of the Rare Elements.—The rare elements and their compounds; identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Assigned reading; laboratory. *II*; (3).

Prerequisite: Two years' work in chemistry.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	27	3	—	—	—	—	—	—	—	Ch.	—

(Arrange)

28. Advanced Qualitative Analysis.—Methods of separation; qualitative reagents; reactions of some of the less common elements. Designed especially for those intending to teach qualitative chemistry. Lectures, with or without laboratory. *I*; *(2-5).

†Formerly chemistry 5c.

Chemistry

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	28	*2-5	—					(Arrange)		355 Ch.	Weber

31. Elementary Physical Chemistry.—The more important principles of physical chemistry and electro-chemistry. Lectures; recitations; problems. Washburn: *Principles of Physical Chemistry*. II; (4).

Prerequisite: Chemistry 1, 2a or 3a; Physics 1a-1b, or 7a-7b; Mathematics 7 or 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	81	4	—	10	—	10	—	10	10	161 Ch.	—

33. Elementary Physical Chemistry.—Molecular weight in gases and solutions; chemical equilibrium; the electrical conductivity of solutions and the attendant phenomena within the solution; thermochemistry. (Laboratory to accompany course 31.) II; (2).

Prerequisite: Chemistry 5a; Physics 8a-8b, or 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	33	2	A, Conference	—	8	—	—	—	—		
			B, Conference	—	9	—	—	—	—		
			C, Conference	—	—	—	8	—	—		
Laboratory, 5 hours either T, W, or T, to be arranged.											

35. Electrochemistry.—(A continuation of Chemistry 31. See also Chemistry 102b.) Theory and application. Lectures; recitations; laboratory. I; (3).

Prerequisite: Chemistry 31, 33.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	35	3	Lecture	—	11	—	11	—	—	161 Ch.	MacInnes
			A, Laboratory	1-4	—	—	—	—	—	128 Ch.	MacInnes
			B, Laboratory	—	—	1-4	—	—	—	128 Ch.	MacInnes

36. The Phase Rule and Its Applications.—A study of equilibria in heterogeneous systems. Lectures and seminar. II; (2).

Prerequisite: Chemistry 31, 33; Mathematics 8, or 7 and 9.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	36	2	—					(Arrange)		353 Ch.	

37. Experimental Problems in Physical and Electrochemistry.—Laboratory and conferences. I; (4). *Time to be arranged.*

Prerequisite: Chemistry 35 or 102b.

Dr. MACINNES

61. Industrial Chemical Laboratory.—The preparation and purification of chemical products from raw materials on a scale sufficient to afford data for determining the economy of the processes employed. (Should be accompanied by either Chemistry 6 or 109.) II; (3).

Prerequisite: Chemistry 5a and 14a.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	61	3	Lecture	—	—	—	11	—	—	111 Ch.	McFarland
			Laboratory	—	1-4	—	1-4	—	—	50 Ch.	McFarland

65. Technical Gas and Fuel Analysis.—Examination of gases, gas mixtures, flue gases and fuels; determination of calorific values; calculation of efficiencies. *I*; (2).

Prerequisite: Chemistry 5a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	65	2	A, Lecture	1	—	—	—	—	—	111 Ch.	Broderson
			B, Lecture	—	1	—	—	—	—	111 Ch.	Broderson
			A, Laboratory	2,3	—	1-4	—	—	—	125 Ch.	Broderson
			B, Laboratory	—	2,3	—	1-4	—	—	125 Ch.	Broderson

66. Technology of Gases.—The manufacture, constituents, and uses of the various forms of gaseous fuel; calorimetry; photometry; the more exact methods of analysis. Lectures; reading; reports; laboratory. *II*; (1).

Prerequisite: Chemistry 65.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	66	1	—	—	—	—	—	—	—	111 Ch.	Parr Broderson

66a. Gas Manufacture.—Carbonization processes, ovens and by-products. *II*; (1).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	66a	1	—	—	—	—	—	—	—	162 Ch.	Parr

69. Metallurgical Laboratory and Assaying.—The fire assay of gold, silver, lead, and copper ores, mattes, and bullion; special experiments illustrating the underlying metallurgical principles; fluxes, slags, and charge calculations; practise in the use of coal, oil, and gas furnaces, and in the measurement of high temperatures. Fulton: *Manual of Fire Assaying*. *I*; (2).

Prerequisite: Chemistry 5a; Geology 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	69	2	Quiz	—	—	—	—	—	10	161 Ch.	McFarland
			A, Laboratory	—	—	—	1-6	—	—	50 Ch.	McFarland
			B, Laboratory	—	—	—	—	1-6	—	50 Ch.	—

72. Paints, Oils, Turpentines, Varnishes, and Protective Coverings for Wood and Metals.—Lectures and laboratory. *I*; (2).

Prerequisite: Chemistry 5a and 14a-14b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	72	2	Lecture	—	9	—	—	—	—	162 Ch.	Parr
			Laboratory	—	—	—	—	—	—	—	Broderson

73. Asphalt, Tar, and Oil Residues.—Sources, characteristics, composition, and examination; binders and dust preventives used in road construction. (For students in highway engineering.) *II*; (2).

Prerequisite: Chemistry 2a or 4.

Chemistry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	73	2	Lecture	9	—	—	—	—	—	162 Ch.	Parr
			Laboratory	—	—	1-4	—	—	—		Broderson

76. Calorimetry of Fuels.—(Advanced Course.) Methods for determining the heat values of solid, liquid, and gaseous fuels. *II*; (2).

Prerequisite: Chemistry 65.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	76	2	—					(Arrange)		162 Ch.	Parr

77. Composition and Classification of Coal.—Classification, changes in composition, weathering, spontaneous combustion, formation of mine gases. Lectures; assigned reading. *II*; (1).

Prerequisite: Chemistry 65.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	77	1	—					(Arrange)		162 Ch.	Parr

78. Metallography.—Constitution and microstructure of metals and alloys and the relations between their properties, chemical and mechanical treatment, and structure. Lectures; reading; laboratory. *II*; (2).

Prerequisite: Chemistry 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	78	2	Conference	—	—	9	—	—	—	111 Ch.	McFarland
			Laboratory	1-4	—	1-4	—	—	—	54 Ch.	McFarland

80. The Elements of Glass Blowing.—A laboratory course in the construction and repair of glass apparatus. *II*; (1). *Time to be arranged.*

Mr. ANDERS

Prerequisite: Two years' work in chemistry.

86. The Chemistry of the Higher Order Compounds.—Complex compounds from the standpoint of the Valence Theory as developed by Werner. *I*; (2).

Prerequisite: Chemistry 9a, 9b, 14a-14b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	86	2	—					(Arrange)		264 Ch.	Smith

90-91. Chemical Inspection Trips.—Required for juniors and seniors in the courses in chemistry and chemical engineering. For the year 1916-17 the trips will occur on April 2nd to 7th, 1917. The expense involved will approximate fifteen to twenty-five dollars for each student. *II*; (no credit).

Assistant Professor MCFARLAND in charge

92a-92b, 93a-93b. Journal Meeting.—(For juniors, seniors, and graduates in chemistry and chemical engineering.) *I, II*; (1). *Time to be arranged.* All members of the teaching staff in the chemical department.

Assistant Professor SMITH and Dr. OLIN in charge

95. History of Chemistry.—Lectures and assigned reading. *I*; (2).

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	95	2	—	10	—	10	—	—	—	255 Ch.	Smith

Courses for Graduates

Graduate students whose major subject is in some department other than chemistry, before taking graduate work for credit in this department, must have had the equivalent of 15 university credits in chemistry, and the ground covered should include satisfactory work in general chemistry and in qualitative and quantitative analysis. Such students are advised to make selections from the following courses: Chemistry 31, 33 (or 102, 102a), 14a, 14b, 9a, 9b, 15 and 25. Courses of a more special nature will not, as a rule, be accepted for graduate work unless preceded by one of the above courses.

For students in agriculture, Chemistry 5a and 13a will not be accepted for graduate credit.

Graduate students who are candidates for an advanced degree in chemistry must have had the equivalent of 25 university credits in chemistry, properly distributed.

For students in chemistry, 5a, 13a, 9, and 9c will not be accepted for graduate credit and 9a, 9b, 14a-14b, 31 and 33 will be accepted only from students entering the Graduate School with the equivalent of 30 university credits in chemistry.

102. Advanced Physical Chemistry.—This course, with 102a, covers a period of two years. The subject is treated from the standpoint of molecular kinetics and thermodynamics. The primary purpose is to develop power to handle successfully a physico-chemical problem rather than merely to impart a knowledge of the phenomena and the principles involved. Lectures and seminar. Nernst: *Theoretische Chemie*, 7th edition. *Twice a week; I, II* ($\frac{3}{4}$ unit).

Prerequisite: Chemistry 1, 2a, or 3a; Physics 1a-1b, 3a-3b; Mathematics 8a or 7 and 9. An elementary knowledge of organic and physical chemistry is desirable.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102	$\frac{3}{4}$ unit	—	—	8	—	8	—	—	162 Ch.	—

[102a. Advanced Physical Chemistry.—Chemical equilibrium; the Phase Rule; certain portions of thermochemistry; photochemistry. (A continuation of 102, with which it alternates.) Nernst: *Theoretische Chemie*. *Twice a week; I, II*; ($\frac{3}{4}$ unit). Not given in 1916-1917.

Prerequisite: The same as course 102.]

[102b. Advanced Electrochemistry.—The modern theories of solution and the principles of thermodynamics in their application to the problems of electrochemistry; electro-motive force and the energy principles underlying the transformation of chemical and electrical energy. *Two times a week; II*; ($\frac{3}{4}$ unit). Not given in 1916-17.

Prerequisite: Chemistry 102; Mathematics 8a, or 7 and 9.]

102c. Advanced Physical and Electrochemistry.—The applications of physico-chemical methods to special problems. Laboratory. *Twice a week; I*; ($\frac{1}{2}$ to 1 unit).

Prerequisite: Chemistry 31, 33; registration in Chemistry 102b, or completion of Chemistry 102, 102a, or 102b; Mathematics 8a or 7 and 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102c	$\frac{1}{2}$ to 1 unit	—	—	—	—	—	—	—	162 Ch.	Tolman

(Arrange)

Chemistry

102d. Electrochemistry.—Theoretical and applied electrochemistry, with emphasis on the technical side of the subject. (For students in electrical engineering.) *Once a week; I; ($\frac{1}{2}$ unit).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102d	½ unit	—	(Arrange)						162 Ch.	MacInnes

102e. Special Topics in Physical Chemistry.—Subject for 1915-16; Radiochemistry. Soddy: *The Chemistry of the Radio Elements*. *Once a week; I; ($\frac{1}{2}$ unit).*

Prerequisite: Chemistry 102 or 102a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	102e	$\frac{1}{2}$ unit	—	(Arrange)						162 Ch.	Tolman

102f. The Chemistry and Physics of Colloids.—The classification of disperse system; adsorption; ultramicroscopy. Electrical, chemical, optical, and catalytic properties of colloids. Seminar; laboratory. (Given in 1916-17, alternating with 102b.) *Twice a week; I; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 31, 33, and 35 or 102b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	102f	$\frac{3}{4}$ unit	—	8	—	8	—	—	—	162 Ch.	MacInnes

103. Advanced Inorganic Chemistry.—Descriptive inorganic chemistry; the rarer elements; the periodic system. Lectures, with or without laboratory. *Two to five times a week; I, II; ($\frac{1}{2}$ to $1\frac{1}{4}$ units).*

Subject	No.	Credits	Section	BOTH SEMESTERS							Room	Instructor
				M	T	W	T	F	S			
Chemistry	103a	$\frac{1}{2}$ to $1\frac{1}{4}$ units	—	(Arrange)							Ch.	—

103a. Advanced Analytical Chemistry.—Special topics. Lectures, with or without laboratory. *One to five times a week; II; ($\frac{1}{2}$ to $1\frac{1}{4}$ units).*

Prerequisite: Chemistry 5b, 9a, 9b, 14a-14b, 31, 33.

Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Chemistry	103a	$\frac{1}{2}$ to $1\frac{1}{4}$ units	—	—	—	11	—	11	—	255 Ch.	Smith	

103b. Special Topics in Inorganic Chemistry.—Subject for 1916-17: The Chemistry of the Higher Order Compounds. Werner: *Neuere Anschauungen auf dem Gebiete der Inorganischen Chemie*; assigned reading from later publications. Lectures; seminar. *Twice a week; I; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 9a, 9b, 14a-14b.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Chemistry	103b	$\frac{3}{4}$ unit	—	—	10	—	10	—	—	255 Ch.	Smith	

103c. Special Topics in Inorganic Chemistry.—Seminar. *Twice a week; II; ($\frac{3}{4}$ unit).*

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	108c	$\frac{3}{4}$ unit	—	(Arrange)						Ch.	—

104. Advanced Organic Chemistry.—Seminar. The open chain compounds of carbon, hydrogen, and oxygen atoms from the standpoint of the atomic linking theory; tautomerism, stereochemistry; and the carbohydrates. Lectures; discussions; laboratory. *Three times a week; I, II; ($\frac{3}{4}$ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104	$\frac{3}{4}$ unit	—	—	11	—	11	1-5	—	255 Ch.	—

[104a. **Advanced Organic Chemistry.**—(Continuation of 104, with which it alternates). The closed chain compounds of the carbon, hydrogen, and oxygen atoms and of the organic compounds of nitrogen; the ureids, alkaloids. Lectures; discussion, laboratory. *Three times a week; I, II; ($\frac{3}{4}$ unit).* Not given in 1916-17].

104b. Advanced Quantitative Organic Analysis.—Proteins, alkaloids, glucosides, volatile oils, and other constituents of animal and vegetable tissues. Plant analysis. Toxicological analysis. The general methods, chemical and physical, of organic analysis. Lectures and seminar. May be accompanied by laboratory work on a selected group of compounds. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104b	$\frac{3}{4}$ unit	—				(Arrange)			263 Ch.	Beal

104c. Special Topics in Organic Chemistry.—Seminar. L. Spiegel: *Chemical Constitution and Physiological Action*. *Once a week; II; ($\frac{1}{4}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104c	$\frac{1}{4}$ unit	—				(Arrange)			255 Ch.	—

105. Advanced Physiological Chemistry.—A more detailed study of the structure and distribution of the proteins. The chemistry of intermediary metabolism and of the glands of internal secretion. Lectures; demonstrations; assigned readings; discussions. *Twice a week; II; ($\frac{3}{4}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105	$\frac{3}{4}$ unit	—				(Arrange)			453 Ch.	Lewis

105a. Advanced Physiological Chemistry.—The more difficult biochemical preparations; the use of analytical methods. Laboratory. *One to five times a week; I, II; ($\frac{3}{4}$ unit).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105a	$\frac{3}{4}$ unit	—				(Arrange)			453 Ch.	Lewis

105c. Advanced Physiological Chemistry.—Seminar. A consideration of some phases of the recent development of physiological chemistry. *Two hours a week; I, II; ($\frac{3}{4}$ unit).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105b, 105c	$\frac{3}{4}$ unit	—				(Arrange)			456 Ch.	Lewis

105d. Chemistry of Plant Nutrition.—The occurrence of organic compounds in plants, and their relation to plant nutrition. Lectures; seminar; laboratory. *Two to four times a week; II; ($\frac{3}{4}$ to $1\frac{1}{4}$ units).*

Chemistry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105d	¾-1¼ units	—					(Arrange)		200 F. G.	Muncie

106. Animal Chemistry (Animal Nutrition.)—Recent advances in the chemistry of nutrition of the lower animals; the chemistry of the functional products; the flesh, fat, milk, and wool of the more common domesticated animals. Lectures; conferences; assigned reading; laboratory. *Five times a week; I, II; (1 to 1½ units).*

Prerequisite: Two years' work in chemistry.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	106	1 to 1½ units	—					(Arrange)		558 Ag.	Grindley

107. Special Problems in Technology of Fuels.—*I; (1 unit).*

Prerequisite: Chemistry 77.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	107	1 unit	—					(Arrange)		162 Ch.	Parr

108. Advanced Metallography.—Constitution and microstructure of metals and alloys; the relations between their properties, chemical and mechanical treatment, and structure. Assigned reading and laboratory. *Twice a week; I; (¾ unit).*

Prerequisite: Chemistry 7 and 78 or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	108	¾ unit	—					(Arrange)		54 Ch.	McFarland

109. Advanced Industrial Chemistry.—Seminar. Some of the more important chemical industries; the development and chemical control of processes. *Twice a week; I, II; (¾ unit).*

Prerequisite: Chemistry 6, 9, 14a-14b, 21 or equivalent.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	109	¾ unit	—	8	—	8	—	—	—	162 Ch.	McFarland

110. Water Supplies.—The sources of contamination of water supplies and the purification of water for potable or technical use. *One to five times a week, I, II; *(½ to 1¼ units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	110	½ to 1¼	—					(Arrange)		60-B Ch.	Bartow

111. Research.—A thesis is usually required of students taking the Master's degree and is always required of students taking the degree of Doctor of Philosophy. (For a description of undergraduate work leading to a thesis, see Chemistry 11.) Work may be taken in the following subjects:

PHYSICAL AND ELECTROCHEMISTRY
INORGANIC CHEMISTRY

Professor TOLMAN, Dr. MACINNES
Assistant Professors SMITH, WEBER

ANALYTICAL CHEMISTRY

FOOD CHEMISTRY

ORGANIC CHEMISTRY

WATER CHEMISTRY

ANIMAL CHEMISTRY (Animal Nutrition)

PHYSIOLOGICAL CHEMISTRY

INDUSTRIAL CHEMISTRY

Assistant Professor SMITH

Dr. BEAL

Professor NOYES

Professor BARTOW

Professor GRINDLEY

Dr. LEWIS

Professor PARR, Assistant Professor MCFARLAND

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	111	—	—							106 Ch.	Noyes and others

CIVIL ENGINEERING

FREDERICK HAYNES NEWELL, S.B., D.ENG., *Professor*IRA OSBORN BAKER, B.S., C.E., D.ENG., *Professor*CHARLES ALTON ELLIS, A.B., *Professor*JAMES ELMO SMITH, B.S., C.E., *Assistant Professor*WILBUR M. WILSON, M.M.E., C.E., *Assistant Professor*CARROLL CARSON WILEY, B.S., C.E., *Associate*NEAL BRYANT GARVER, B.S., C.E., *Associate*GEORGE WELLINGTON PICKLES, JR., B.C.E., C.E., *Instructor*WILLIAM HORACE RAYNER, B.S., C.E., *Instructor*RAYMOND EARL DAVIS, M.S., C.E., *Instructor*C STANLEY SALE, B.S., *Instructor*BENJAMIN LESTER BOWLING, *Assistant in Laboratory*

Courses for Undergraduates

27. Plane Surveying.—The theory, use, and adjustment of the compass, transit, and level; the computation of areas and the partitioning of land; the U. S. land survey methods, re-establishment of corners and boundaries, and interpretation of deeds; farm and city surveying. Problems with the tape, compass, transit, and level. Breed and Hosmer: *Principles and Practice of Surveying*, Vol. I. DAVIS: *Manual of Surveying*. I; (3).

Prerequisite: General Engineering Drawing 1, 2; Mathematics 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	27	3	E	8	—	—	—	8-11	—	101, 102 E. H.	Davis Rayner
			E	—	—	8-11	—	—	—	109 E. H.	
			F	10	1-4	—	1-4	—	—	101, 102 E. H.	
			G	—	—	1	—	1-4	—	101, 102 E. H.	
			G	1-4	—	—	—	—	—	102 E. H.	

28. Higher Surveying.—The theory and use of the transit and plane-table in making topographic surveys; methods; determination of latitude, longitude, and azimuth by stellar and solar observations; topographic drawing; a complete topographic survey based on a system of triangulation. Breed and Hosmer: *Principles and Practice of Surveying*, Vol. II. Davis: *Manual of Surveying*. II; (3).

Prerequisite: Civil Engineering 27; Physics 1a, 3a, and registration in Physics 1b, 3b.

Civil Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	28	3	E	8	—	8-11	—	8-11	—	105,109 E. H.	Davis
			F	10	1-4	—	1-4	—	—	105,109 E. H.	Pickels
			G	1-4	—	1	—	1-4	—	102,105 E. H.	Rayner

31. Surveying.—(For students in landscape architecture.) The theory, use, and adjustment of the compass, level, transit, and plane-table. The determination of distances by pacing, and with chain and tape, and of areas with compass and transit; profile leveling; problems with plane-table. Raymond: *Plane Surveying. I; (3).*

Prerequisite: Mathematics 4; Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	31	3	—	—	8-11	10	8-11	—	—	109,101,105 E. H.	Pickels Rayner

32. Topographic Surveying.—(For students in landscape architecture.) The theory and use of the stadia; conventional topographical signs; contour construction; its use in grading and drainage problems; advanced work with the plane-table. Each student will prepare a large scale topographic map of a portion of the campus. Raymond: *Plane Surveying. II; (3).*

Prerequisite: Civil Engineering 31.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	32	3	—	—	8-11	10	8-11	—	—	101,102,105 E. H.	Pickels Rayner

35. Surveying.—(For mining engineering students and others who do not expect to take Civil Engineering 28.) The use and adjustment of the compass, level, transit, and plane-table. The determination of distances with tape and by stadia; the determination of areas with the compass and transit; differential and profile leveling; the U. S. land survey methods; elements of topographical surveying. Breed and Hosmer: *Principles and Practice of Surveying*, Vol. I. Davis: *Manual of Surveying. I; (3).*

Prerequisite: Physics 1b and 3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	35	3	—	10	1-4	—	1-4	—	—	101 E. H.	Rayner

51. Railroad Surveying.—Economic location, construction, and maintenance of railways. Curves, turnouts, and earthworks. Preliminary and location surveys of a line of sufficient length to secure familiarity with the methods in actual practise. Each student makes a complete set of maps, profiles, and estimates. Pickels and Wiley: *Railroad Surveying. I; (5).*

Prerequisite: Civil Engineering 27, 28.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	51	5	E	9,10	9-12	—	—	9-12	8,9	105 E. H.	Pickels Smith Wiley
			F	10,11	1-4	—	—	10,11	9-12	204 Cer.	
			G	—	1-4	—	1-4	2,3	10,11	105 E. H.	
			H	1-4	—	1,2	1-4	1,2	—	109 E. H.	

52. Roads and Pavements.—Construction and maintenance of earth, gravel, macadam, concrete, and bituminous roads; street pavements, and their adaptation to country roads. Road-building machinery. Effect of travel on road surfaces. Dust prevention and street cleaning. Baker: *Roads and Pavements*. II; (3).

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2; Civil Engineering 27, 28, 51.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	52	3	E	9	—	9	—	9	—	206 Cer.	Smith Wiley
			F	10	—	10	—	10	—	205 E. H.	
			G	11	—	11	—	11	—	101 E. H.	

53. Railroad Surveying.—First eleven weeks of Civil Engineering 51, for juniors in municipal and sanitary engineering. I; (3).

Prerequisite: Civil Engineering 27, 28.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	53	3	G	—	1-4	—	1-4	2,3	10,11	105 E. H.	Smith

55. Roads and Pavements.—(For students in landscape gardening.) Baker: *Roads and Pavements*. I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	55	2	—	—	—	9	—	9	—	205 E. H.	Garver

58. Graphic Statics.—(For students in mining engineering.) Determination of stresses in roof and bridge trusses and in three-hinged arches. Malcol: *Elements of Graphic Statics*. II; (2).

Prerequisite: Theoretical and Applied Mechanics 20, 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	58	2	—	—	—	2,3	—	2,3	—	211 E. H.	Smith

60. Structural Stresses.—The determination of stresses in roofs, bridges, and steel-skeleton buildings, by algebraic and graphic processes. II; (3).

Prerequisite: Mathematics 2, 4, 6; Theoretical and Applied Mechanics 20, 21, 29, 10; General Engineering Drawing 1, 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	60	3	E	8	—	8	—	8	8-11	205, 214 E. H.	Ellis Wilson
				—	8	—	—	—	—	221 E. H.	
			F	11	—	11	9-12	11	—	205, 211 E. H.	
				—	8	—	—	—	—	—	
			G	9	8	9	—	9	—	205 E. H.	
				—	9-12	—	—	—	—	211 E. H.	

Civil Engineering

62. Structural Details.—Design of details for roofs, bridges, and steel frame buildings; detail drawings and shop bills. *II*; (3). Carnegie: *Pocket Companion*, last edition.

Prerequisite: Registration in Civil Engineering 60.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	62	3	E	—	—	—	—	1-5	—	211 E. H.	} Garver
			F	—	—	1-5	—	—	211 E. H.		
			G	1-5	—	—	—	—	211 E. H.		

70. Seminar.—Reading and discussion of papers. Each student presents one major and two minor papers upon assigned topics, and participates in the discussion of other papers. *II*; (1).

Prerequisite: Full junior standing in civil engineering.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	70	1	E	1,2	—	—	—	—	—	101 E. H.	Baker Davis
			F	—	—	—	—	1,2	—	219 E. H.	
			G	—	—	1,2	—	—	—	219 E. H.	

76. Surveying.—U. S. public land surveys; principles of re-establishing corners. Use of transit in finding distances, areas, and in laying out buildings; use of the level in finding profiles and contours. Davis: *Manual of Surveying*, *II*; (2).

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2; Physics 1a-1b, 3a-3b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	76	2	—	—	1,2	—	1,2	—	—	102 E. H.	Pickels

77. Masonry Construction.—Baker: *Masonry Construction*. *I*; (4).

Prerequisite: Theoretical and Applied Mechanics 20, 21, 29, 10; Civil Engineering 60.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	77	4	E	11	11	—	11	11	—	219 E. H.	} Baker Sale
			F	9	9	—	9	9	—	219 E. H.	
			G	8	8	—	8	8	—	219 E. H.	

79. Cement Laboratory Practise.—Standard tests for hydraulic cement. *I*; (1).

Prerequisite: Theoretical and Applied Mechanics, 20, 21, 29, 10; Civil Engineering 60; Registration in Civil Engineering 77.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	79	1	E	—	—	—	—	1,2	—	Cem. Lab.	Sale Bowling
			F	—	1,2	—	—	—	Cem. Lab.		
			G	1,2	—	—	—	—	Cem. Lab.		
			T	—	—	1,2	—	—	Cem. Lab.		

80. Engineering Contracts and Specifications.—The law of contracts; general and technical clauses used in engineering specifications. Johnson: *Engineering Contracts and Specifications*. *II*; (2).

Prerequisite: Full senior standing in the College of Engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	80	2	E	—	10	—	10	—	—	205 E. H.	Baker
			F	11	—	11	—	—	—	219 E. H.	
			G	—	8	—	8	—	—	205 E. H.	
			T	—	11	—	11	—	—	205 E. H.	

81. Theory of Reinforced Concrete.—Reinforced concrete beams, columns and slabs. Hool: *Reinforced Concrete Construction. I*; (2).

Prerequisite: Full senior standing in the College of Engineering.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	81	2	E	—	9	—	9	—	—	205 E. H.	Ellis
			F	—	11	—	11	—	—	205 E. H.	
			G	11	—	11	—	—	—	205 E. H.	

82. Reinforced Concrete Design.—Plain and reinforced concrete arches, culverts, dams, bridges, and retaining walls. Hool: *Reinforced Concrete Construction, Vol. II. II*; (4).

Prerequisite: Civil Engineering 81.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	82	4	F	1-4	—	1-4	—	1-4	—	214 E. H.	Sale

83. Bridge Design.—(For railway civil engineers, and civil engineers taking the general civil engineering option.) Determination of stresses and sections of a plate girder and a truss span; stress sheet, general design drawings, and estimate of weights. *I*; (3).

Prerequisite: Civil Engineering 60, 62.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	83	3	E	—	1-4	—	1-4	—	—	214 E. H.	Wilson

85. Steel Bridge Design.—(For civil engineers taking the structural engineering option.) The same as 83 above, but a fuller course. *I*; (5).

Prerequisite: Civil Engineering 60, 62.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	85	5	F	1-4	—	1-4	—	1-4	—	211 E. H.	Wilson

87. Advanced Bridge Analysis.—Continuous, draw, cantilever, suspension, and metal-arch bridges. Johnson, Bryan, and Turneure: *Modern Framed Structures, Part II. I*; (2).

Prerequisite: Civil Engineering 60, 62; and registration in Civil Engineering 83 or 85.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	87	2	F	—	10	—	10	—	—	205 E. H.	Ellis

88. Steel Building Design.—Stresses and sections of the steel frame of mill and office buildings; footings and grillages; design drawings and estimate of weights. *II*; (3).

Prerequisite: Civil Engineering 60, 62.

Civil Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	88	3	F	—	1-4	—	1-4	—	—	211 E. H.	Wilson

89. Hydro-Economics.—The occurrence of water in nature; its conservation, regulation, and use for power and in industries; irrigation, drainage, transportation, domestic supply; the legal title to the use of water. *I*; (2).

Prerequisite: Senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	89	2	—	10	—	10	—	—	—	221 E. H.	Newell

90. Hydro-Economics.—(A continuation of Civil Engineering 89.) *II*; (2).

Prerequisite: Civil Engineering 89.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	90	2	—	10	—	10	—	—	—	221 E. H.	Newell

91. Highway Bridge Design.—Types of highway bridges; determination of location, size, and type. Steel bridges, beam, low-truss, and through-truss; methods and cost of construction. *I*; (4).

Prerequisite: Civil Engineering 60, 62.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	91	4	G	—	1-4	—	1-4	—	9-12	211 E. H.	Garver

92. Concrete Bridges and Culverts.—Reinforced-concrete slab, girder, and arch bridges; falsework and forms; estimates of quantities; costs. *II*; (2).

Prerequisite: Civil Engineering 77, 79, 81, 91.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	92	2	G	—	9-12	—	9-12	—	—	214 E. H.	Garver

93. Road Construction.—Merits of different types of roads and pavements; principles of design; preparation of plans, specifications, and estimates of cost. *I*; (3).

Prerequisite: Civil Engineering 52; Theoretical and Applied Mechanics 21, 29.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	93	3	G	—	9-12	1-4	9-12	—	—	204 Cer.	Wiley

94. Highway Administration.—Road construction and maintenance in Europe and America; taxation and methods of financing road work; the relation of highway improvement to social and economic welfare. *II*; (3).

Prerequisite: Senior standing in civil engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	94	3	G	8	—	8	—	8	—	206 Cer.	Wiley

96. Road Laboratory.—Examining and testing bituminous and non-bituminous road materials; interpretation of the results. *II; (2).*

Prerequisite: Civil Engineering 52, 77, 79; registration in Chemistry 73.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
C. E.	96	2	G	1-4	1-4	—	—	—	—	Road Lab. }
			H	—	—	—	1-4	1-4	—	Road Lab. {
										Wiley
										Bowling

97-98. Thesis.—A problem in investigation or design, subject to the approval of the head of the department. Only students of high standing are permitted to take a thesis. *I; (1); II; (2). Time to be arranged.*

Prerequisite: Full senior standing in civil engineering.

99. Inspection Trip.—*I; (no credit).*

Prerequisite: Senior standing.

Courses for Graduates

Entrance upon graduate work in civil engineering presupposes the full undergraduate course in that subject.

101. Irrigation and Drainage.—The survey, examination, construction, maintenance, and operation of works for irrigation and drainage of agricultural lands; water rights. *Twice a week; I, II; (½ unit). Time to be arranged.*

Professor NEWELL

107. Bridge Engineering.—Deflections; the statically indeterminate frame; swing bridges and arches; special graphic methods; suspension bridges; secondary stresses; impact. *Two or three times a week; I, II; (1 unit or more). Time to be arranged.*

Professor ELLIS

124. Steel Building Construction.—Steel framing of fireproof office buildings, hotels, and industrial buildings; wind bracing; eccentrically loaded columns; analysis of special details; erection methods and costs. *Twice a week; I, II; (1 unit or more). Time to be arranged.* Assistant Professor WILSON

THE CLASSICS

HERBERT JEWETT BARTON, A.M., *Professor, Chairman*

CHARLES MELVILLE MOSS, PH.D., *Professor*

WILLIAM ABBOTT OLDFATHER, PH.D., *Professor*

*ARTHUR STANLEY PEASE, PH.D., *Professor*

HOWARD VERNON CANTER, PH.D., *Associate Professor*

RODNEY POTTER ROBINSON, A.M., *Assistant*

GREEK

Major: 20 hours, excluding Greek 1a-1b, 17, 18, and 19.

Minors: 20 hours chosen from foreign languages (Latin being especially recommended), English literature, history, and philosophy.

LATIN

Major: 20 hours, excluding Latin 1a, 6a, and 12.

Minors: 20 hours chosen from foreign languages (Greek being especially recommended), English literature, history, and philosophy.

*On leave of absence.

CLASSICS

Major: 20 hours in Greek and Latin, excluding Greek 1a-1b, 16, 17, 18, 19, and 20, and Latin 1a, 6a, 12, 13, and 19. At least six hours shall be carried in the secondary language and the remaining hours in the primary language.

Minors: 20 hours chosen from foreign languages, English literature, history, and philosophy.

GREEK

Courses for Undergraduates

The courses in translation naturally follow each other in the following sequence: 1a-1b, 3, 7 (5), 6 (8). Courses 1a-1b, 3, and 4 are intended for students who cannot present Greek for entrance to the University, but who desire to commence the study of the language. Course 2a-2b, may be taken after course 1a-1b and course 14 after courses 5 or 7. Courses 16, 17, 18, and 19 are open to sophomores, juniors, and seniors; 20 is open to those who have completed one year in history or classics.

1a-1b. Grammar and Reader.—First semester: Attic forms; reading of simple prose. Second semester: Xenophon's *Anabasis*, Book 1. *I, II*; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	1a	4	—	—	11	11	11	11	—	114 L. H.	Robinson

SECOND SEMESTER

Greek 1b 4 Schedule the same as for 1a (first semester).

2a-2b. New Testament Greek.—First semester: Reading of selections. Second semester: Lectures on Canon and Text. *I, II*; (2).

Prerequisite: Greek 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	2a	2	—	—	10	—	10	—	—	114 L. H.	Moss

SECOND SEMESTER

Greek 2b 2 Schedule the same as for 2a (first semester).

3. Second Year Greek.—Xenophon's *Anabasis*, Books II-IV; grammatical drill. *I*; (3).

Prerequisite: Greek 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	3	3	—	2	—	2	—	2	—	120 L. H.	Robinson

4. Second Year Greek.—Homer, six Books of the *Iliad*. *II*; (3)

Prerequisite: Greek 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	4	3	—	2	—	2	—	2	—	120 L. H.	Canter

7. Greek Drama.—Three plays from the great dramatists. *II*; (3).

Prerequisite: Greek 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Greek	7	3	—	9	—	9	—	9	—	114 L. H.	Moss

8. Plato.—Selected dialogues, including the *Apology* and the *Phaedo*.*Prerequisite:* Greek 4.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Greek	8	3	—	11	—	11	—	11	—	124 L. H.
										Instructor Oldfather

14. Greek Prose Composition.—II; (1).*Prerequisite:* Greek 5 and 6, or 7 and 8.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Greek	14	1	—	—	—	—	—	11	—	124 L. H.
										Instructor Moss

Greek Life and Literature in English

(Courses 16-20 presuppose no knowledge of Greek and are open to all students except freshmen.)

16. The Private and Public Life of the Greeks.—Lectures illustrated by photographs and slides; prescribed readings; I; (1).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Greek	16	1	—	—	—	—	3	—	—	120 L. H.
										Instructor Moss

17. Greek Poetry in Translations.—I; (2).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Greek	17	2	—	—	11	—	11	—	—	124 L. H.
										Instructor Moss

18. Greek Prose in Translations.—I; (2).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Greek	18	2	—	11	—	11	—	—	—	120 L. H.
										Instructor Moss

19. Greek Drama in Translations.—II; (2).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Greek	19	2.	—	—	11	—	11	—	—	124 L. H.
										Instructor Moss

20. Greek History.—(This course is described by the department of history as History 5.) I; (3).

Prerequisite: One course in history or the classics. Not open to freshmen.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Greek	20	3	—	3	—	3	—	3	—	120 L. H.
										Instructor Oldfather

Courses for Graduates

104. Homer and the Homeric Question.—Lectures and readings. I, II; (1 unit). *Time to be arranged.* Professor OLDFATHER

107. Greek Oratory.—One or more speeches of each of several orators; lectures and reports. I, II; (1 unit).

The Classics

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Greek	107	1 unit	—	—	8	—	8	—	—	114 L. H.	Moss

110. Bibliography and Criticism.—Once a week; I, II; (¼ unit).

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Greek	110	¼ unit	—	2	—	—	—	—	—	104 L. H.	Oldfather and others

LATIN

1a-1b. Ovid and Virgil.—First semester: Selections from the *Amores*, *Heroides*, and *Metamorphoses*. Second semester: Selections from the *Aeneid*. I, II; (4).

Prerequisite: Three entrance units in Latin.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	1a	4	—	—	8	8	8	8	—	120 L. H.	—

SECOND SEMESTER

Latin 1b 4 Schedule the same as for 1a (first semester).

2a-2b. Livy, Plautus, and Terence.—First semester: Selections from Livy, the story of Hannibal. Second semester: The *Rudens* of Plautus and the *Phormio* of Terence. I, II; (4).

Prerequisite: Four entrance units in Latin.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	2a	4	—	—	9	9	9	9	—	120 L. H.	Barton

SECOND SEMESTER

Latin 2b 4 Schedule the same as for 2a (first semester).

3. Sallust and Cicero.—Selections from the *Jugurthine War*; *De Senectute*. I; (3).

Prerequisite: Latin 2a-2b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	3	3	—	—	9	9	—	9	—	114 L. H.	Canter

4. Horace and Catullus.—Selections. II; (3).

Prerequisite: Latin 2a-2b.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	4	3	—	10	—	10	—	10	—	120 L. H.	Robinson

5a-5b. Latin Composition.—Grammatical drill and practise in the simpler forms of expression. I, II; (1).

Prerequisite: Latin 1a-1b or its equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	5a	1	—	8	—	—	—	—	—	120 L. H.	Robinson

SECOND SEMESTER

Latin 5b 1 Schedule the same as for 5a (first semester).

6. Cicero.—Selections from the *Orations*. *I*; (4).*Prerequisite*: Two entrance units in Latin.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	6	4	—	—	10	10	10	10	—	120 L. H.
										Instructor Robinson

Roman Life and Literature in English

(Courses 12 and 13 presuppose no knowledge of Latin; open to all students except freshmen.)

12. Virgil and Horace in English Translations.—The *Aeneid* and selections from Horace. *I*; (2).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	12	2	—	—	3	—	3	—	—	114 L. H.
										Instructor Barton

13. Roman Life.—The family, organization of society, education, marriage, amusements, with some attention to the monuments. Lectures and assigned readings illustrated by photographs and slides. *II*; (1).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	13	1	—	—	—	—	3	—	—	202 L. H.
										Instructor Barton

19. Roman History.—(This course is described by the department of history as History 6.) Not open to freshmen. *II*; (3).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	19	3	—	8	—	8	—	8	—	120 L. H.
										Instructor Canter

9. Teachers' Course.—The purpose and methods of preparatory Latin instruction; the teacher's preparation. *II*; (2).

Prerequisite: 18 hours in Latin. A portion of this requirement may be waived in the case of those who have taught Latin.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	9	2	—	—	2	—	2	—	—	120 L. H.
										Instructor Barton

10. Latin Composition.—The leading principles; imitation of assigned models. *II*; (2).

Prerequisite: 12 hours of Latin, including Latin 5a-5b or equivalent.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	10	2	—	—	11	—	11	—	—	120 L. H.
										Instructor Barton

Courses for Advanced Undergraduates and Graduates

7. Horace and Juvenal.—Selections. *I*; (3).

Prerequisite: 12 hours in Latin.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	7	3	—	10	—	10	—	10	—	114 L. H.
										Instructor Barton

The Classics

14. Seneca.—Selections from his letters and tragedies *II*; (3).

Prerequisite: 15 hours in Latin.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	14	3	—	10	—	10	—	10	—	114 L. H.
										Instructor Barton

21. Special Topics in Ancient History.—(This course is described by the department of history as History 11.) The decline of ancient civilization. *II*; (3).

Prerequisite: Junior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	21	3	—	11	—	11	—	11	—	114 L. H.
										Instructor Oldfather

Courses for Graduates

Students desiring to take graduate work in Latin should have had at least three years of college Latin in addition to the Latin presented to meet entrance requirements.

102. Roman Oratory.—*Twice a week; II; (1 unit). Time to be arranged.*
Assistant Professor CANTER

106. Terence.—*Twice a week; II; (1 unit). Time to be arranged.*
Professor OLDFATHER

108. Tacitus.—*The Histories. Twice a week; I; (1 unit).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	108	1 unit	—	—	2	—	2	—	—	114 L. H.
										Instructor Barton

110. Bibliography and Criticism.—*Once a week; I, II; (¼ unit).*

BOTH SEMESTERS										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Latin	110	¼ unit	—	2	—	—	—	—	—	114 L. H.
										Instructor Canter and others

112. Roman Historiography.—*Twice a week; I; (1 unit). Time to be arranged.*
Assistant Professor CANTER

113. Plautus.—*Twice a week; I; (1 unit). Time to be arranged.*
Professor OLDFATHER

114. Caesar.—*Twice a week; II; (1 unit). Time to be arranged.*
Professor OLDFATHER

115. Roman Elegy.—*Twice a week; I; (1 unit). Time to be arranged.*
Assistant Professor CANTER

COMMERCIAL LAW

(See BUSINESS ORGANIZATION AND OPERATION.)

COMPARATIVE LITERATURE

JOSEPH EUGENE GILLET, PH.D., *Associate in Comparative Literature and German*

1. Tragedy.—Theory and practise from classical times to the present day. Lectures; readings; reports. *I*; (3).

Prerequisite: Two years of college work, or the permission of the instructor. Foreign language is not required.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Literature	1	3	—	9	—	9	—	9	—	205 L. H.
										Instructor Gillet

2. Comedy.—Theory and practise from classical times to the present day. Lectures; readings; reports. *II*; (3).

Prerequisite: Two years of college work, or the permission of the instructor. Foreign language is not required.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Literature	2	3	—	9	—	9	—	9	—	205 L. H.
										Instructor Gillet

3. Lessing and the Reform of Dramatic Criticism in Europe.—The theories of the "Hamburgische Dramaturgie" examined historically and illustrated by a study of the dramas and treatises discussed by Lessing. *II*; (3).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Literature	3	3	—	8	—	8	—	8	—	205 L. H.
										Instructor Gillet

COMPARATIVE PHILOLOGY

LEONARD BLOOMFIELD, PH.D., *Assistant Professor*

For Advanced Undergraduates and Graduates

1. Introduction to the Study of Language.—Phonetics; the development of forms of speech; dialects and the spread of languages; the study and teaching of language. *I*; (3).

Prerequisite: The consent of the instructor.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Philology	1	3	—	9	—	9	—	9	—	215 L. H.
										Instructor Bloomfield

2. Comparative Philology of the Indo-European Languages.—Attention will be given chiefly to Greek, Latin, and the Germanic languages, including English. *II*; (2).

Prerequisite: The consent of the instructor.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Philology	2	2	—	—	9	—	9	—	—	215 L. H.
										Instructor Bloomfield

Dairy Husbandry

3. Elementary Sanskrit.—Reading and grammar. *I*; (3).

Prerequisite: The consent of the instructor.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Philology	3	3	—	10	—	10	—	10	—	320 L. H.
										Instructor Bloomfield

4. Elementary Sanskrit.—Continuation of 3. *II*; (3).

Prerequisite: Comparative Philology 3.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Philology	4	3	—	10	—	10	—	10	—	205 L. H.
										Instructor Bloomfield

DAIRY HUSBANDRY

HARRY ALEXIS HARDING, PH.D., *Professor, Dairy Bacteriology*

*WILBUR JOHN FRAZER, M.S., *Professor, Dairy Farming*

MARTIN JOHN PRUCHA, PH.D., *Assistant Professor, Dairy Bacteriology*

NELSON WILLIAM HEPBURN, M.S., *Assistant Professor, Dairy Manufactures*

EDWARD FREDERICK KOHMANN, PH.D., *Associate, Dairy Chemistry*

RAY STILLMAN HULCE, M.S., *Associate, Milk Production*

WILLIAM WODIN YAPP, M.S., *Instructor, Dairy Husbandry*

PAUL WILLIAM ALLEN, M.S., *Assistant, Dairy Bacteriology*

CHRIS SIMEON RHODE, B.S., *Assistant, Dairy Husbandry*

FRED WILBUR TANNER, PH.D., *Instructor, Dairy Bacteriology*

EDWARD G SQUIRE, B.S., *Assistant, Dairy Manufactures*

RAY WASHINGTON HESS, PH.D., *Assistant, Dairy Chemistry*

1. Milk Testing.—Babcock test; tests for purity and adulteration; lactometer; tests for acidity, moisture, and salt; qualitative separation of milk into its components, and a brief study of the components; significance of the composition of milk. Lectures; recitations; problems; laboratory; assigned readings. *I* or *II*; (3).

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Dairy	1	3	A	—	8,9	—	8,9	—	8,9	505 Ag.
Husbandry			B	1,2	—	1,2	—	1,2	—	505 Ag.
										Instructor Kohmann

2. Dairy Cattle.—Selection, feeding, and management; dairy type and its relation to production; herd improvement; feeding considerations for production, for development; history, characteristics and adaptability of breeds; milking machines; barn arrangements; herd management. Students having credit in Dairy Husbandry 16 should register for laboratory work only, for which they will receive two hours' credit. All others must register for both lectures and laboratory. Lectures; recitations; laboratory. *I*; (5).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Dairy	2	5	—	8	—	8	—	8	—	202 Ag.
Husbandry				—	8,9	—	8,9	—	—	S. P.
										Instructor Hulce Yapp

*On leave of absence first semester.

3. Elements of Dairy Husbandry.—The dairy herd; dairy sanitation; milk testing; milk; milk products. Required of all freshmen in the general curriculum in agriculture. Lectures; demonstrations. *I* or *II*; (1).

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Dairy	3	1	A	11	—	11	—	—	—	Morrow
Husbandry			B	1	—	1	—	—	—	Hall

4. Ice Cream Making.—Mixing and freezing of ice cream, sherbets, and other frozen products, and the physical principles involved; types of freezers; flavoring materials, fillers, and binders; ice cream standards; the study and making of condensed milk and its relation to the ice cream industry; the theory and practise of artificial refrigeration, and its use in the ice cream plant. This course is accompanied by one inspection trip, costing from \$10 to \$15. *I* or *II*; (3).

Prerequisite: Dairy Husbandry 1 or 5.

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Dairy	4	3	—	—	10,11	—	10,11	—	10,11	454 Ag.
Husbandry										

5. The Composition of Dairy Products.—Rapid commercial tests; qualitative and quantitative study; the composition of milk proteins and their significance; composition, chemical and physical properties of milk fat and factors influencing them. Lectures; recitations; problems; assigned reading; laboratory. *II*; (3).

Prerequisite: Chemistry 13a. It is desirable that students registering in this course take Chemistry 9 or its equivalent, which after 1919-20 will be made a prerequisite.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Dairy	5	3	—	10,11	—	10,11	—	10,11	—	—
Husbandry										Kohmann

6. Germ Life and the Dairy.—Designed primarily to acquaint students with the general relation of bacteriology to dairy problems. Lectures; assigned readings. *I*; (1).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Dairy	6	1	—	—	—	—	—	3	—	—
Husbandry										Harding

7. Creamery Buttermaking and Factory Management.—Types of creameries; raw product received; grading; pasteurization; use of commercial starters; ripening, churning, salting, and working butter; butter composition and scoring; explanation of various physical phenomena in making, packing, and storing of butter; creamery by-products; refrigeration. Creamery location and plans; business management and accounting of various types of creameries. This course is accompanied by one inspection trip costing from \$10 to \$15. Lectures; assigned readings; laboratory. *II*; (5).

Prerequisite: Dairy Husbandry 1. After 1917-18 Accountancy 1a and 1b will be made prerequisite. After 1918-19 the requirements will be Dairy Husbandry 5 and Accountancy 1a and 1b.

Dairy Husbandry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	7	5	—	1,2	1,2	1,2	1,2	1,2	8-11	—	Hepburn Lang

8. City Milk Supply.—Production, transportation, plant, and delivery. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	8	2	—	8	—	—	—	8	—	454 Ag.	Harding Lang

11. Dairy Bacteriology.—The bacteria of milk and its products; methods of introduction, effect, and methods of control. Lectures. *I*; (2).

Prerequisite: Bacteriology 1 or 5; two years of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	11	2	—	8	—	—	—	8	—	454 Ag.	Harding Allen

12a-12b. Dairy Bacteriology.—The bacteria in milk and its products. Laboratory. *I*, *II*; (4).

Prerequisite: Bacteriology 1 or 5; two years of university work.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	12a	4	—	—	8,9	8,9	8,9	—	8,9	454 Ag.	Harding Allen

SECOND SEMESTER

Dairy Husbandry	12b	4	Schedule the same as for 12a (first semester).								
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13. General Course in Dairy Manufactures.—Milk production, care, and distribution; handling cream on the farm; care and use of the hand separator; a study of various makes of machines; making and marketing butter under farm conditions; soft cheese; Neufchatel; cream; pimento; cottage; manufactured milk drinks; ice cream making; plans and equipment for the farm dairy. This course is offered especially for the student who has only a general interest in the subject of dairy manufactures. The subject will be treated chiefly from the farm point of view. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	13	3	—	1,2	—	1	—	1,2	—	—	Hepburn, Lang, and others

17. Advanced Study of Dairy Breeds.—History; environment; breed characteristics; prominent families and individuals; pedigree work with emphasis upon performance records; reliability of official tests; systems of advanced registry; problems peculiar to the breeder of pure-bred dairy cattle. Lectures; assigned reading; seminar work. *II*; (2).

Prerequisite: Two years of University work; Animal Husbandry 8; Dairy Husbandry 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	17	2	—	—	3	—	3	—	—	—	Yapp

21. Systems of Dairy Farming.—Relation of the cow and the herd to profits; how to establish and perpetuate a dairy herd of the highest efficiency; economy of crops and rations on a dairy farm; systems of cropping; the organization of a dairy farm; location and arrangement of buildings and lots; farm accounts, records, and inventories; markets; care and disposal of milk at the greatest profit. *II; (5).*

Prerequisite: Dairy Husbandry 2.

SECOND SEMESTER												
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Dairy Husbandry	21	5	—	10	10	10	10	10	—	—	Fraser	

22. Cheese Making.—Ripening and setting milk; cutting, cooking, and dipping curd; cheddaring, milling, matting, and salting curd; pressing and curing cheese; cottage, Neufchatel, and other varieties; practise in making the more common varieties. *I; (2).*

Prerequisite: Dairy Husbandry 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Dairy	22	2	—	—	1,2	—	1,4	—	—	—	—
Husbandry											

Courses for Graduates

101. Economic Milk Production.—Differences in the efficiency of dairy cows, the cause and effect of these differences and their relation to successful dairy farming. *Twice a week; I, II; (1 unit). Time to be arranged.* Given only second semester, 1916-17. Professor FRASER

104. Scientific Readings.—Reading and discussion of some German or French bacteriological text. Designed to broaden the outlook in bacteriology and to quicken the ability to read. Recommended for first and second year students. *I, II; (½ unit). Time to be arranged.*

Professor HARDING, Assistant Professor PRUCHA

105. Bacteriological Literature.—Assigned systematic readings designed to cover a portion or the entire field of dairy bacteriology. Each student will be required to prepare and deliver an acceptable course of lectures. Recommended for second and third year students. *Once a week, or once in two weeks; I, II; (½ or 1 unit). Time to be arranged.* Professor HARDING

106. Research on Assigned Problems.—Open to graduate students whose development permits their undertaking problems of dairy bacteriology with only general supervision. A study of the literature of the selected problem followed by laboratory study and reports. *I, II; (½ to 2 units). Time to be arranged.* Professor HARDING, Assistant Professor PRUCHA

107. Dairy Chemistry.—A survey of the literature; special investigation on assigned problems. *Once a week; I, II; (1 unit).* Dr. KOHMANN

DRAWING, GENERAL ENGINEERING

HARRY WILLARD MILLER, M.E., *Assistant Professor*

ROBERT KENT STEWARD, C.E., *Associate*

FRANCIS MARION PORTER, M.S., *Associate*

HARVEY HERBERT JORDAN, B.S., *Associate*

Economics

RUFUS CRANE, A.B., B.S., *Instructor*

CLARENCE ALLEN ATWELL, B.S., *Instructor*

MERTON FORD BANKS, *Assistant*

ROBERT EMMET MURPHY, *Half-time Assistant*

1. Elements of Drafting.—Lettering; isometric oblique and perspective drawing, orthographic projection; machine sketching; working drawings. Lettering; mechanical styles and the making of name plates and titles. Mechanical drawing; 12 plates from copy and 6 plates from models, with tracings of each. Dimensioned sketches from parts of standard machines; complete working drawings. Tracings duplicated in blue-print form. Time sketches of equipment. Miller: *Mechanical Drafting. I or II; (4).*

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
G. E. D.	1	4	A	8-11	—	8,9	—	8-11	—	300 T. B.	} Miller and others	
			B	1-4	—	1,2	—	1-4	—	300 T. B.		
			C	—	8-11	—	8-11	—	8,9	300 T. B.		
			D	—	1-4	—	1-4	—	10,11	300 T. B.		
			SECOND SEMESTER									
			D	—	1-4	—	1-4	—	10-12	300 T. B.	Miller and others	

Miller
and others
and others

2. Descriptive Geometry.—The point, line, and plane; the properties of surfaces; intersections and developments (for architects, perspective instead of intersections and developments). Practical problems; recitations. Three drawing room plates, 2 hours each, 5 problems per plate, and 2 home plates, 5 problems each per week. Miller: *Descriptive Geometry. I or II; (4).*

Prerequisite: Solid geometry, college algebra, plane trigonometry.

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
G. E. D.	2	4	A	8-11	—	8,9	—	8-11	—	300 T. B.
			B	1-4	—	1,2	—	1-4	—	300 T. B.
			C	—	8-11	—	8-11	—	8,9	300 T. B.
			D	—	1-4	—	1-4	—	10,11	300 T. B.

Miller
and others

21. Advanced Descriptive Geometry.—Review of course 2; the cylinder, cone, convolute, and warped surface; intersections of these surfaces in pairs, and by planes; planes tangent; developable and approximately developable surfaces and doubly curved and complex surfaces of revolution; practical applications and methods. *II; (2).*

Prerequisite: General Engineering Drawing, 1, 2.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
G. E. D.	21	2	—	—	—	—	2,3	2,3	8-12	300 T. B.

(Any 4 hours from above schedule.)

ECONOMICS

(See also BUSINESS ORGANIZATION AND OPERATION and TRANSPORTATION.)

DAVID KINLEY, PH.D., LL.D., *Professor*

MAURICE HENRY ROBINSON, PH.D., *Professor*

ERNEST LUDLOW BOGART, PH.D., *Professor*

NATHAN AUSTIN WESTON, PH.D., *Assistant Professor*

SIMON LITMAN, Dr. Jur. Pub. et Rer. Cam., *Assistant Professor*

CHARLES MANFRED THOMPSON, PH.D., *Assistant Professor*

JOHN GIFFEN THOMPSON, PH.D., *Instructor*

CHARLES LESLIE STEWART, PH.D., *Instructor*
 HENRY ELMER HOAGLAND, A.M., *Instructor*
 FREDERIC ARTHUR RUSSELL, PH.D., *Instructor*
 MERVIN HAROLD HUNTER, PH.D., *Instructor*
 PAUL HOWARD DOUGLAS, A.M., *Instructor*
 JOSEPH BOYCE VERNON, A.B., *Assistant*
 WILLIAM HENRY DREESEN, A.M., *Assistant*
 MAURICE ELZIN MURPHY, A.M., *Assistant*
 PEMBROKE HOLCOMB BROWN, A.B., *Assistant*

Major: For students in the College of Liberal Arts and Sciences twenty hours, made up of Economics 1 and any other courses for which it is a prerequisite.

Minor: Twenty hours in any one or two of the following subjects: history, philosophy, political science, and sociology.

Economics, 7, 22, and 26 are open to freshmen without previous requirement. Economics 27 is also open to freshmen, but requires credit in course 26 or an approved high school course in commercial geography.

Economics 1 and 3 are the fundamental courses in economics. They are prerequisites for most of the advanced courses and students expecting to do advanced work in economics should take them both in their sophomore year.

Economics 2, though open to all students who have had 30 hours of university work, is primarily for students in the Colleges of Agriculture and Engineering and in courses in household science, chemistry, chemical engineering and other sciences. It may not be used as a prerequisite for advanced courses in economics except as indicated.

Courses for Undergraduates

1. **Principles of Economics.**—(See note preceding the description of courses in economics above.) *I*; (5).

Prerequisite: Thirty hours of University work.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Economics	1	5	A, Discussion	—	—	—	—	8	—	100 Com.	Thompson, C. M.	
			B, Discussion	—	—	—	—	9	—	100 Com.	Thompson, C. M.	
			C, Discussion	—	—	—	—	10	—	100 Com.	Weston	
			D, Discussion	—	—	—	—	11	—	100 Com.	Weston	
			A ¹ , Quiz	8	8	8	8	—	—	101 Com.	Thompson, C. M.	
Students who elect the A quizzes must take the A discussion; those electing the B quizzes, the B discussion, and so on.			A ² , Quiz	8	8	8	8	—	—	111 Com.	Russell	
			A ³ , Quiz	8	8	8	8	—	—	204 Com.	Hunter	
			A ⁴ , Quiz	8	8	8	8	—	—	308 Com.	Vernon	
			B ¹ , Quiz	9	9	9	9	—	—	101 Com.	Hoagland	
			B ² , Quiz	9	9	9	9	—	—	111 Com.	Russell	
			B ³ , Quiz	9	9	9	9	—	—	202 Com.	Hunter	
			B ⁴ , Quiz	9	9	9	9	—	—	312 Com.	Douglas	
			C ¹ , Quiz	10	10	10	10	—	—	101 Com.	Thompson, J. G.	
			C ² , Quiz	10	10	10	10	—	—	111 Com.	Hoagland	
			C ³ , Quiz	10	10	10	10	—	—	307 Com.	Stewart	
			C ⁴ , Quiz	10	10	10	10	—	—	308 Com.	Douglas	
			D ¹ , Quiz	11	11	11	11	—	—	101 Com.	Murphy	
			D ² , Quiz	11	11	11	11	—	—	111 Com.	Stewart	
			D ³ , Quiz	11	11	11	11	—	—	210 Com.	Thompson, J. G.	
			D ⁴ , Quiz	11	11	11	11	—	—	307 Com.	Vernon	

Students who elect the A quizzes must take the A discussion; those electing the B quizzes, the B discussion, and so on.

Economics

2. Principles of Economics.—(See note preceding the description of courses in economics above.) *II*; (3).

Prerequisite: Thirty hours of university work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	2	5	A ¹	8	—	8	—	8	—	101 Com.	Hoagland
			A ²	8	—	8	—	8	—	111 Com.	Russell
			A ³	8	—	8	—	8	—	204 Com.	Hunter
			B ¹	10	—	10	—	10	—	101 Com.	Thompson, C. M.
			B ²	10	—	10	—	10	—	111 Com.	Russell
			B ³	10	—	10	—	10	—	204 Com.	Hunter
			B ⁴	10	—	10	—	10	—	307 Com.	Stewart
			C ¹	11	—	11	—	11	—	101 Com.	Thompson, C. M.
			C ²	11	—	11	—	11	—	111 Com.	Douglas
			C ³	11	—	11	—	11	—	307 Com.	Hoagland
			D ¹	1	—	1	—	1	—	101 Com.	Russell
			D ²	1	—	1	—	1	—	204 Com.	Hunter
			D ³	1	—	1	—	1	—	210 Com.	Thompson, J. G.

3. Money and Banking.—The history and theory of money, credit, and banking. (See note preceding the description of courses in economics above.) *II*; (3).

Prerequisite: Economics 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	3	3	A, Discussion	—	11	—	—	—	—	100 Com.	Weston
			B, Discussion	11	—	—	—	—	—	100 Com.	Weston
			A, Quiz	—	—	8	—	8	—	308 Com.	Vernon
			B, Quiz	—	—	8	—	8	—	202 Com.	Douglas
			C, Quiz	—	—	11	—	11	—	308 Com.	Stewart
			D, Quiz	—	—	11	—	11	—	202 Com.	Vernon
			E, Quiz	—	—	11	—	11	—	312 Com.	Murphy
			F, Quiz	—	8	—	8	—	—	308 Com.	Vernon
			G, Quiz	—	8	—	8	—	—	202 Com.	Hunter
			H, Quiz	—	11	—	11	—	—	307 Com.	Douglas
			I, Quiz	—	11	—	11	—	—	111 Com.	Stewart
			J, Quiz	—	11	—	11	—	—	204 Com.	Brown

7. English Economic History.—The industrial development of England; the manorial system; the guilds; the commercial policy and expansion of the seventeenth and eighteenth centuries; the industrial and manufacturing growth of the nineteenth century. *Open to freshmen and sophomores only.* *I*; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	7	3	Lecture	9	—	—	—	—	—	100 Com.	Bogart
			A, Quiz	—	—	9	—	9	—	308 Com.	Bogart
			B, Quiz	—	9	—	9	—	—	308 Com.	Bogart
			C, Quiz	—	2	—	2	—	—	101 Com.	Douglas

16c. Agricultural Economics.—The application of the principles of economics to the problems of agriculture. *II*; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	16c	3	—	3	—	3	—	3	—	206 Com.	Thompson, J. G.

22. The Economic History of the United States.—The explorations and settlements that led to the colonization of this continent; the growth of industry, agriculture, commerce, transportation, and labor from the agricultural communities of the colonies to the industrial and commercial society of today. *Open to freshmen only. II; (3).*

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	22	3	A	8	—	8	—	8	—	206 Com.	Murphy
			B	—	8	—	8	—	8	111 Com.	Murphy
			C	—	8	—	8	—	8	204 Com.	Brown
			D	9	—	9	—	9	—	101 Com.	Bogart
			E	9	—	9	—	9	—	111 Com.	Thompson, C. M.
			F	—	9	—	9	—	9	101 Com.	Brown
			G	—	9	—	9	—	9	111 Com.	Dreesen
			H	—	10	—	10	—	10	204 Com.	Dreesen
			I	2	—	2	—	2	—	101 Com.	Douglas
			J	2	—	2	—	2	—	204 Com.	Vernon
			K	3	—	3	—	3	—	101 Com.	Vernon

23. Statistics.—Sources of statistical data; purposes of statistics; preparation of schedules; analysis of returns; methods of computing averages and index numbers; construction and use of frequency tables; graphic methods and their uses; limitations of statistics; application of statistical methods to current problems. *II; (3).*

Prerequisite: Economics 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	23	3	—	9	—	9	—	9	—	307 Com.	Hoagland

26. Economic Resources.—Environment influences affecting commercial and industrial development; products and industries of different countries; the extent and distribution of the resources and the industrial and commercial activities of the United States. *Open to freshmen and sophomores only. I; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
(The following sections are open to freshmen only.)											
Economics	26	3	A	8	—	8	—	8	—	202 Com.	Brown
			B	—	8	—	8	—	8	202 Com.	Brown
			C	9	—	9	—	9	—	307 Com.	Vernon
			D	—	9	—	9	—	9	307 Com.	Vernon
			E	10	—	10	—	10	—	202 Com.	Litman
			F	—	10	—	10	—	10	202 Com.	Murphy
			G	11	—	11	—	11	—	202 Com.	Hunter
			H	—	11	—	11	—	11	202 Com.	Hunter
			I	1	—	1	—	1	—	202 Com.	Brown
			J	2	—	2	—	2	—	202 Com.	Russell
(The following sections are open to sophomores only.)											
			K	1	—	1	—	1	—	204 Com.	Russell
			L	2	—	2	—	2	—	204 Com.	Dreesen
			M	10	—	10	—	10	—	204 Com.	Dreesen
			N	—	10	—	10	—	10	204 Com.	Dreesen

27. Modern Industries.—The raw materials of commerce; their geographical distribution and economic significance; the leading industries which utilize these materials; sources of power; investment of capital; employment of men and of machinery; the progressive stages of production; the distribution of

Economics

finished commodities. *Open to freshmen and sophomores only. II; (3).*

Prerequisite: Economics 26, or an approved high school course in commercial geography.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	27	3	Lecture	10	—	—	—	—	—	100 Com.	Litman
			A, Quiz	—	—	10	—	10	—	202 Com.	Litman
			B, Quiz	—	10	—	10	—	—	202 Com.	Litman
			C, Quiz	—	—	9	—	9	—	202 Com.	Dreesen

32. Marketing Farm Produce.—Prices of farm products; seasonal aspects; middlemen; speculation; transportation; terminal problems; regulative and protective legislation; crop statistics; public markets; direct sales; contrast between European and American marketing conditions. *II; (2).*

Prerequisite: Economics 1 or 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	32	2	—	—	3	—	3	—	—	111 Com.	Stewart

33. Economics of Insurance.—The historical development and economic aspects of insurance. *I; (2).*

Prerequisite: Economics 1 and 3.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	33	2	—	—	9	—	9	—	—	210 Com.	Robinson

34. Property Insurance.—Technical characteristics and economic effects of fire, marine, title, and credit insurance and corporative suretyship. *II; (2).*

Prerequisite: Economics 1 and 3.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	34	2	—	—	9	—	9	—	—	204 Com.	Robinson

35. Corporations.—The organization and financial management of corporations, including promotion, issuance of securities, capitalization, financial accounting, insolvency, and reorganizations. *Open to junior and senior engineering students only. I; (3).*

Prerequisite: Economics 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	35	3	—	10	—	10	—	10	—	312 Com.	Robinson

Courses for Undergraduates and Graduates

4. Financial History of the United States.—Colonial, revolutionary, and federal finances, with emphasis upon receipts and expenditures, the debt, war finance, internal revenue and the fiscal aspects of the tariff; currency and coinage and the inflationist movements. *I; (3).*

Prerequisite: Economics 1 and 3; senior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	4	3	—	8	—	8	—	8	—	206 Com.	Douglas

5. Public Finance.—Public expenditures; financial administration; taxation; public debts. *I*; (3).

Prerequisite: Economics 1 and 3. Students who have had 6 hours in history and Political Science 1, and who present a statement from the department of political science showing that they are taking political science as a major, may be admitted without Economics 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	5	3	—	10	—	10	—	10	—	206 Com.	Bogart

8. The Money Market.—Money and credit; the functions of money broker and banker; the concentration of financial dealings at such centers as New York and London; international payments and the determination of rates of foreign exchange; the seasonal demands for money; causes of fluctuation in rates of discount; monetary panics and crises; investments; the financial aspects of dealings on the stock and produce exchanges. *II*; (2).

Prerequisite: Economics 1 and 3, Business Organization and Operation 1, senior standing. For the present year former Economics 6 will be accepted instead of Business Organization and Operation 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	8	2	—	—	—	11	—	11	—	206 Com.	Weston

9. Practical Banking.—Banking practise in the United States. *I*; (2).

Prerequisite: Economics 1 and 3; Business Organization and Operation 1; senior standing. For the present year former Economics 6 will be accepted instead of Business Organization and Operation 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	9	2	—	11	—	11	—	—	—	206 Com.	Weston

10. Corporation Management and Finance.—The growth, causes, and forms of corporation; the promotion, financiering, incorporation, and capitalization of corporate consolidations; their organization and securities; relation of stockholders and directors; analysis of reports; stock speculation; relation of industrial corporations to international competition; receiverships and reorganizations; social and political effects. *II*; (3).

Prerequisite: Economics 1 and 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	10	3	Lecture	—	—	11	—	11	—	100 Com.	} Robinson
			A, Quiz	11	—	—	—	—	—	206 Com.	
			B, Quiz	—	11	—	—	—	—	101 Com.	
			C, Quiz	—	—	—	11	—	—	101 Com.	
			D, Quiz	10	—	—	—	—	—	202 Com.	

11. Industrial Consolidation.—The growth of monopoly; monopoly prices and methods; the ability of trusts to effect prices, wages, interests, and profits; the proposed plans for controlling trusts. *I*; (3).

Prerequisite: Economics 10.

Economics

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	11	3	—	9	—	9	—	9	206 Com.	Robinson

12a-12b. Labor Problems.—First semester: Emergence of a wage earning class; relations with other classes; early organizations; influence of free land and growth of industry; development of modern trade unions; employers' associations; comparison with European experience. Second semester: Collective bargaining; unorganized labor; immigration; woman and child labor; industrial education; unemployment; bonus systems; agencies for and methods of industrial peace; labor legislation; attitude of the public. The second semester's work may not be taken without the first except with the consent of the instructor. *I, II; (3).*

Prerequisite: Graduate or senior standing; Economics 1 and 3. Students who have had 6 hours in history and Sociology 1 and who present a statement from the department of sociology showing that they are taking sociology as a major, may be admitted without Economics 3.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	12a	3	—	2	—	2	—	2	206 Com.	Hoagland

SECOND SEMESTER

Economics	12b	3	Schedule the same as for 12a (first semester).							
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13. Economic Development of Europe Since the Industrial Revolution.—The economic history of France, Germany, and England since the industrial revolution. *II; (3).*

Prerequisite: Sixty hours of university work, including Economics 1 and 3. Students who present a statement from the department of history showing that they are taking history as a major, may be admitted without Economics 3.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	13	3	—	10	—	10	—	10	206 Com.	Bogart

14. Agricultural Cooperation.—The organization, financing, and management of cooperative associations for the promotion of farming. *Open to junior and senior students of agriculture only. II; (2).*

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	14	2	—	2	—	2	—	—	206 Com.	Stewart

15. Rural Credit.—The credit and banking needs of farmers and rural communities and means of supplying them. *Open to junior and senior students of agriculture only. I; (2).*

Prerequisite: Economics 1 or 2.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	15	2	—	2	—	2	—	—	206 Com.	Stewart

17. Economic History of Agriculture.—The development of agriculture in various countries at various times. Land tenure and landed property; large, medium, and small farms or estates; economic conditions and results of exten-

sive and intensive culture; agricultural credit, markets, and labor; state of the agricultural class; organization in agriculture, and its relation to other industries and to the state. *II*; (2).

Prerequisite: Economics 1 or 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	17	2	—	—	3	—	3	—	—	307 Com.	Thompson, J. G.

19. United States Industry, 1820-1860.—Growth, distribution, and character of the population, with reference to the public domain and the westward movement; development of inland communication and transportation; foreign commerce and the carrying trade; distribution, extent, and methods of agriculture; manufacturing, labor and labor saving machinery; currency and banking; the tariff. *I*; (2).

Prerequisite: Open to graduates and seniors who have had Economics 1 and are taking a major in one of the social sciences.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	19	2	—	—	10	—	10	—	—	206 Com.	Thompson, C. M.

20. United States Industry Since 1860.—Improved methods of agriculture and the effect of exploiting new lands; the factory system; organized labor; evolution of "big business"; growth of urban centers; mining; economic effects of immigration; monetary questions; railroads and the regulation of interstate trade; foreign commerce; the tariff. *II*; (2).

Prerequisite: Open to graduates and seniors who have had Economics 1 and are taking a major in one of the social sciences.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	20	2	—	—	10	—	10	—	—	206 Com.	Thompson, C. M.

21. Socialism and Economic Reform.—Proposed reforms affecting the economic basis of society. Utopian and scientific socialism; revisionism; socialism as a political movement; the theories of anarchism and syndicalism; current economic problems as affected by socialistic theories. *II*; (2).

Prerequisite: Economics 1 and 3. Students who have had 6 hours in history and Sociology 1 and who present a statement from the department of sociology showing that they are taking sociology as a major may be admitted without Economics 3.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	21	2	—	—	8	—	8	—	—	206 Com.	Douglas

22. Mechanism and Technique of Domestic Commerce.—Internal trade; wholesale and retail trade organizations; markets, fairs, auctions, stock and produce exchanges; department, mail-order, and cooperative stores; commercial travelers; commercial competition; modern advertising; mercantile credit. *I*; (3).

Prerequisite: Economics 1 and 3.

Economics

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	28	3	Lecture	—	—	9	—	—	—	100 Com.	Litman
			A, Quiz	9	—	—	—	9	—	204 Com.	Litman
			B, Quiz	—	9	—	9	—	—	204 Com.	Litman

[29. **Foreign Commerce and Commercial Politics.**—Problems of international trade; changes in theories and in policies; economic systems (mercantile, free trade, protective); classes of customs tariffs; commercial treaties; history of tariff legislation in the United States. *II*; (3). Not given in 1916-17.

Prerequisite: Economics 28.]

31. **Organization of Foreign Commerce.**—Exporting and importing; ocean transportation; line and charter traffic; institutions for furthering export trade; the consular service; entry of goods; the work of the custom house. *II*; (3).

Prerequisite: Economics 28.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	31	3	—	9	—	9	—	9	—	204 Com.	Litman

Courses for Graduates

Students entering upon graduate work in economics must have had a thorough course in the principles of the science and should also have studied some special part of the field, such as public finance or money and banking.

101. **Economic Theory.**—*Twice a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Economics	101	1 unit	—	—	9	—	9	—	—	206 Com.	Kinley

[102. **Theory of Money, Credit, and Prices.**—*Twice a week; I, II; (1 unit).* Not given in 1916-17.]

104. **Foreign Commerce of the United States.**—The foreign commerce of the United States as shown in government publications. *Twice a week; I, II; (1 unit).* Time to be arranged. Assistant Professor LITMAN

[105. **Public Finance.**—The history and theory of public revenue and expenditure. *Twice a week; I, II; (1 unit).* Not given in 1916-17.]

[107. **The Corporation in Economic Evolution.**—*Twice a week; I, II; (1 unit).* Not given in 1916-17.]

[109. **Theory of Industrial Consolidations.**—The nature of industrial consolidations; the conditions and causes responsible for their development and their effects upon the production and distribution of wealth. *Twice a week; I, II; (1 unit).* Not given in 1916-17.]

110. **Investments.**—Nature, character, and functions of investments. Classes, including direct investments and securities of various types. Methods of judging investments. State control. *Twice a week; I, II; (1 unit).* Time to be arranged. Professor ROBINSON

118. **Seminar.**—*I, II. Time to be arranged.*

Professor KINLEY

120. History of Economic Thought.—*Twice a week; I, II; (1 unit). Time to be arranged.*
Dr. J. G. THOMPSON

122. Advanced Economic History of the United States.—*Twice a week; I, II; (1 unit). Time to be arranged.*
Professor BOGART

EDUCATION

WILLIAM CHANDLER BAGLEY, PH.D., *Professor*
CHARLES HUGHES JOHNSTON, PH.D., *Professor*
HORACE ADELBERT HOLLISTER, A.M., *Professor*
GUY MONTROSE WHIPPLE, PH.D., *Professor*
BENJAMIN FRANKLIN PITTENGER, PH.D., *Associate*
HARRIET JOSEPHINE BERNINGER, A.B., *Assistant*
JOHN ALFORD STEVENSON, A.M., *Assistant and Secretary*
WARREN KENNETH LAYTON, A.B., *Assistant*

Introductory Courses

1. Introduction to Education.—(a) The American public-school system; (b) the principles and aim of education; the biological basis, heredity, and environment; instinct, habit, and habit-formation; memory, and the higher mental processes. (This course is by Senate ruling required of all students who are given the official indorsement of the Appointments Committee for teaching positions in secondary schools.) *I or II; (4).*

Prerequisite: Junior standing. Psychology 1 is desirable as a prerequisite. Students who have completed Psychology 1 should register, if possible, in Section A; other students should register in Section B.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	1	4	A	1	1	1	1	—	—	410 U. H.	Bagley
			B	2	2	2	2	—	—	214 U. H.	Bagley
SECOND SEMESTER											
			A	1	1	1	1	—	—	214 U. H.	Bagley
			B	2	2	2	2	—	—	214 U. H.	Bagley

2. History of Education.—History of the evolution of educational theory, institutions, and practise as related to the development of the Greek, Roman, medieval, and modern civilizations. *II; (5).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Education	2	5	—	9	9	9	9	9	—	202 L. H.

Intermediate Courses

10. The Technique of Teaching.—Types of classroom exercises and preparation of teaching plans; the hygiene of instruction; classroom management; professional ethics. Observation of teaching in neighboring high schools. (This course with Education 1 is, by Senate ruling, required of all students who are given the official recommendation of the Appointments Committee for teaching positions in secondary schools.) *I or II; (3).*

Prerequisite: Education 1.

Education

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	10	3	A	1	—	1	—	1	—	202 L. H.	Berninger
			B	2	—	2	—	2	—	202 L. H.	Pittenger
			C	3	—	3	—	3	—	202 L. H.	Pittenger

SECOND SEMESTER											
				M	T	W	T	F	S	Room	Instructor
			A	1	—	1	—	1	—	202 L. H.	Berninger
			B	2	—	2	—	2	—	202 L. H.	Pittenger
			C	3	—	3	—	3	—	202 L. H.	Pittenger

[16. Social Education.—I; (3). Not given in 1916-17.]

25. Educational Psychology.—(Introductory course.) Instinct; habit and the acquisition of skill; perception and memory; conception, judgment, and reasoning. Lectures; demonstrations. I; (3).

Prerequisite: Psychology 1 or Education 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	25	3	—	9	—	9	—	9	—	417 U. H.	Whipple

Courses for Advanced Undergraduates and Graduates

4. Problems of Educational Administration.—The interpretation of present tendencies as exemplified in the school systems of typical cities and states, and in recent educational experiments in administration, discipline, and methods of teaching. I; (3).

Prerequisite: Education 1, 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	4	3	—	11	—	11	—	11	—	113 L. H.	Pittenger

5. Comparative Education.—Organization, administration, and basic national ideals of the school systems of the United States, Germany, England, and France, with reference to secondary education and to the training of teachers. I; (3).

Prerequisite: Education 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	5	3	—	9	—	9	—	9	—	113 L. H.	Johnston

6. Principles of High-School Education.—The evolution of high schools and of the fundamental conceptions of secondary education; proposed reorganization; relation of high schools to the state systems; legal status; articulation with the elementary school, the college, the technical school, the community, and the home; the teaching staff; reconstruction of curriculums; "controls" of instruction; direction of "student activities." This course is planned for those who expect to teach in secondary schools. I; (3).

Prerequisite: Education 1 or its equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	6	3	—	10	—	10	—	10	—	113 L. H.	Johnston

27. High-School Curriculums.—Important historic curriculums for secondary education; modern curriculum-making; professional supervision; textbooks, apparatus, and teaching devices; the psychology of high-school subjects; the constructing of curriculums for typical communities. *II; (3).*

Prerequisite: Education 1 or 6 (preferably both).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	27	3	—	10	—	10	—	10	—	113 L. H.	Johnston

13-14. Educational Classics.—The principal educational writings of Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Comenius, Rousseau, Pestalozzi, Froebel, and Herbert Spencer. (Ordinarily required for the Doctor's degree in education.) *I, II; (3).*

Prerequisite: Education 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	13	3	—	3	—	3	—	3	—	103 L. H.	Bagley

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	14	3	—	3	—	3	—	3	—	103 L. H.	Bagley

15. School Hygiene.—The hygienic aspects of school architecture and equipment; the heating, ventilation, and lighting of school buildings; the hygiene of posture, exercise, and fatigue, and of reading and writing; the bearing of hygienic principles upon the program of studies and the daily time table; the mental health of teachers and pupils; communicable diseases and the relation of school authorities to health authorities. (Graduate credit subject to approval of the Executive Faculty.) *II; (2).*

Prerequisite: Education 1, or normal-school graduation, or two years of teaching experience, with at least junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	15	2	—	—	3	—	3	—	—	417 U. H.	Whipple

18. Method in Educational Research.—Statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees.) *I; (2).*

Prerequisite: Education 1, or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	18	2	—	—	2	—	2	—	—	113 L. H.	Whipple

19. Readings in French and German Educational Literature.—*I; (2).*

Prerequisite: Education 1, and moderate facility in reading French and German. *Time to be arranged.* Professor WHIPPLE

20a. Theory of Supervision.—The problems involved in the training of teachers in service; methods of measuring educational products; qualities of merit and causes of failure in teachers; selection of teachers; organization of teachers' meetings and other agencies for improving the teaching service. *II; (3).*

Prerequisite: Education 1, or its equivalent.

Education

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	20a	3	—	11	—	11	—	11	—	113 L. H.	Pittenger

41. Vocational Education.—The social significance of vocational education; institutions and methods of vocational education in elementary and secondary schools; federal, state, and municipal provisions; recent legislation; present tendencies. *I*; (3).

Prerequisite: Education 1 or an equivalent satisfactory to the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	41	3	—	—	3	—	3	—	—	117 L. H.	Johnston

42. Auxiliary Education.—The institutions and methods for the training of defectives and delinquents; the Binet-Simon tests and other methods of mental diagnosis; educational treatment of morons and of moral delinquents; methods of teaching sensory defectives (the blind and the deaf); public institutions of auxiliary education and their administration. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	42	2	—	—	9	—	9	—	—	417 U. H.	Whipple

43. Mental Tests.—Laboratory drill in the technique of mental tests, including tests of sensory capacities; attention; memory; learning; suggestibility; inventiveness; systems of tests for diagnosis of mental age; general intellectual status; mental retardation. *II*; (2).

Prerequisite: Education 25 or an equivalent, and the consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	43	2	—	—	10,11	—	10,11	—	—	417 U. H.	Whipple

45. Problems in Educational Psychology.—*II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	45	2	—	—	—	—	—	—	—	417 U. H.	Whipple

(Arrange)

Courses for Graduates

101. Seminar in Educational Theory.—The seminar in the fall of 1916 will consider the philosophical bases of educational theory. *I*; (1 unit).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	101	1 unit	—	—	7,8	—	—	—	—	103 L. H.	Bagley Bode

106. Seminar in Secondary Education.—Organization, administration, and special methods of secondary education. Reports and discussions of technical investigations in the fields of high school administration and pedagogy. *II*; (1 unit).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	106	1 unit	—	—	—	—	4,5	—	—	103 L. H.	Johnston

112. Principles of Education.—For graduate students who are not majoring in education and who have not taken undergraduate courses in education. The course involves: (a) a survey of the American public-school system; (b) a statement of the leading principles and doctrines of educational science; and (c) a brief reference to the technique of teaching and the problems of class management. *Twice a week; II; ($\frac{1}{2}$ unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	112	$\frac{1}{2}$ unit	—	—	3	—	3	—	—	103 L. H.	Bagley

119. The Elementary Curriculum.—The functions and values of elementary-school studies; time allotments; practical exercises in the construction of curriculums. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	119	1 unit	—	—	4,5	—	—	—	—	103 L. H.	Pittenger

125. Seminar in Educational Psychology.—The topic of the seminar for 1916-17 will be announced later. *Once a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	125	1 unit	—	—	—	4,5	—	—	—	417 U. H.	Whipple

Departmental Conference.—All graduate students majoring in education are expected to meet with the departmental staff every alternate Monday from 7 to 9 p. m. *I, II; (no credit).*

ELECTRICAL ENGINEERING

ELLERY BURTON PAINE, M.S., E.E., *Professor, Acting Head of the Department*

MORGAN BROOKS, Ph.B., M.E., *Professor*

EDWARD HARDENBERGH WALDO, A.B., M. S., M.E., *Assistant Professor*

PHILIP SHERIDAN BIEGLER, B.S., E.E., *Assistant Professor*

LEONARD VAUGHAN JAMES, M.S., E.E., *Associate*

IRA WILLIAM FISK, M.S., E.E., *Associate*

ABNER RICHARD KNIGHT, M.E., *Associate*

CHARLES RUBY MOORE, B.S., *Associate*

JOHN WILLIAMS DAVIS, B.S., *Instructor*

4. Elementary Electrical Engineering.—Electrical machinery; selection, installation, and operation; distribution of power; motor applications. *II; (2).*

Prerequisite: Physics 1a-1b, 3a-3b; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	4	2	EU	—	1	—	1	—	—	205 E. L.	} Brooks
			OT	—	10	—	10	—	—	206 E. L.	

8. Electric Currents and Apparatus.—Direct and alternating current circuits and machines; storage batteries. (Especially for students in chemical engineering.) *I; (3).*

Prerequisite: Physics 1a-1b, 3a-3b; registration or credit in Mathematics 7; registration in Electrical Engineering 68.

Electrical Engineering

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	8	3	Z	8	—	8	—	8	—	203 E. L.	Davis

11. Direct Current Apparatus.—Generators, motors, distribution circuits; storage batteries. (For students in mechanical engineering.) *I*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; Mathematics 8 or 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	11	3	P	8	—	8	—	8	—	207 E. L.	Brooks
			Q	9	—	9	—	9	—	207 E. L.	

12. Alternating Current Apparatus.—Generators and motors, transformers, distribution systems. (For students in mechanical engineering.) *II*; (3).

Prerequisite: Electrical Engineering 11, 61.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	12	3	P	8	—	8	—	8	—	207 E. L.	Brooks
			Q	1	—	1	—	1	—	207 E. L.	

25. Direct Current Apparatus.—Laws of electric and magnetic circuits; construction and operation of direct current generators and motors. *I*; (4).

Prerequisite: Registration in Electrical Engineering 75 and Physics 4a; Mathematics 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	25	4	K	10	10	10	—	10	—	206 E. L.	James Fisk Knight
			L	11	—	11	11	11	—	207 E. L.	
			M	8	8	8	8	—	—	206 E. L.	
			N	—	9	9	9	9	—	206 E. L.	

26. Alternating Currents.—A mathematical and graphical treatment of the principles of periodic currents; theory of the simple phenomena in transmission lines and transformers. *II*; (4).

Prerequisite: Electrical Engineering 25; Physics 4a; registration in Electrical Engineering 76.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	26	4	K	10	10	10	—	10	—	203 E. L.	James Fisk Knight
			L	11	—	11	11	11	—	206 E. L.	
			M	8	8	8	8	—	—	206 E. L.	
			N	—	9	9	9	9	—	206 E. L.	

35. Alternating Current Apparatus.—Transformers and generators. *I*; (4).

Prerequisite: Electrical Engineering 26, 76.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	35	4	K	—	11	11	11	11	—	203 E. L.	Paine James Fisk Knight
			L	10	10	10	10	—	—	205 E. L.	
			M	9	—	9	9	9	—	203 E. L.	
			N	8	8	8	—	8	—	205 E. L.	

36. Alternating Current Apparatus.—Synchronous, induction, and commutator motors; rotary converters; distributed inductance and capacity; transient phenomena. *II*; (4).

Prerequisite: Electrical Engineering 35, 85.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	36	4	K	—	11	11	11	11	—	203 E. L.	Paine
			L	10	10	10	10	—	205 E. L.	James	
			M	9	—	9	9	9	—	203 E. L.	Fisk
			N	8	8	8	—	8	—	205 E. L.	Knight

55. Electrical Design.—Electromagnets and dynamos, direct and alternating; transformers. *I*; (2).

Prerequisite: Electrical Engineering 26; registration in Electrical Engineering 35.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	55	2	KLMN	—	—	—	8	—	—	207 E. L.	Waldo Knight
			K	1-4	—	—	—	—	—	204 E. L.	
			L	—	1-4	—	—	—	—	204 E. L.	
			M ₁	—	—	—	—	1-4	—	204 E. L.	
			M ₂	—	9-12	—	—	—	—	204 E. L.	
			N	—	—	1-4	—	—	—	204 E. L.	

56. Electrical Design.—Induction motors and converters; power plant design. Gebhardt: *Steam Power Plant Engineering*. *II*; (4).

Prerequisite: Electrical Engineering 35; Mechanical Engineering 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	56	4	KLMN	11	—	—	8	—	—	207 E. L.	Waldo Knight
			K	—	—	8	—	—	—	203 E. L.	
			L	—	—	9	—	—	—	207 E. L.	
			M	—	9	—	—	—	—	203 E. L.	
			N	—	10	—	—	—	—	207 E. L.	
			K	1-4	—	—	—	—	—	204 E. L.	
			L	—	1-4	—	—	—	—	204 E. L.	
			M ₁	—	—	1-4	—	—	—	204 E. L.	
			M ₂	—	—	—	—	8-11	—	204 E. L.	
			N ₁	—	—	—	9-12	—	—	204 E. L.	
			N ₂	—	—	—	—	1-4	—	204 E. L.	

61. Direct Current Laboratory.—Circuits and machines. (For students in mechanical engineering.) *I*; (1).

Prerequisite: Registration in Electrical Engineering 11.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	61	1	P	—	8-11	—	8-11	—	—	200 E. L.	Biegler Moore Davis
			Q	—	2-5	—	2-5	—	—	200 E. L.	

62. Alternating Current Laboratory.—Alternating current circuits and machines. (For students in mechanical engineering.) *II*; (1).

Prerequisite: Registration in Electrical Engineering 12.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	62	1	P Q	—	1-4	—	1-4	—	8-11	200 E. L.	Biegler Moore Davis

Electrical Engineering

64. Electrical Engineering Laboratory.—Testing of dynamos and motors. *II*; (1).

Prerequisite: Registration in Electrical Engineering 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	64	1	E	—	—	1-4	—	—	—	200 E. L.	Biegler
			O T	—	—	—	1-4	—	—	200 E. L.	Moore
			U	—	9-12	—	—	—	—	200 E. L.	Davis

68. Electrical Engineering Laboratory.—Direct and alternating current circuits and machines. *I*; (1).

Prerequisite: Registration in Electrical Engineering 8.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	68	1	Z	1-4	—	—	—	1-4	—	200 E. L.	Biegler Davis Moore

71-72. Electrical Engineering Laboratory.—The construction of special apparatus or other work approved by the department. (Elective for juniors and seniors.) *I, II*; *(1 to 3). *Time to be arranged.*

75. Electrical Engineering Laboratory.—Direct current laboratory accompanying Electrical Engineering 25. *I*; (2).

Prerequisite: Registration in Electrical Engineering 25

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	75	2	KN	—	—	—	—	11	—	206 E. L.	Biegler Moore Davis
			LM	—	—	—	—	8	—	206 E. L.	
			K	—	—	—	8-11	—	8-11	200 E. L.	
			L	—	—	—	1-4	—	—	200 E. L.	
			M	—	—	9-12	—	—	—	200 E. L.	
						1-4					
			N	9-12	—	—	—	—	—	200 E. L.	

76. Electrical Engineering Laboratory.—Determination of the flux and E.M.F. waves of alternators. Alternating current circuits, instruments. *II*; (2).

Prerequisite: Electrical Engineering 25, 75; registration in Electrical Engineering 26.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	76	2	KLM	—	—	—	9	—	—	207 E. L.	Biegler Moore Davis
			N	—	—	—	11	—	—	207 E. L.	
			K	—	—	—	—	1-4	—	200 E. L.	
			L	—	9-12	—	—	—	8-11	200 E. L.	
			M	—	—	9-12	—	—	—	200 E. L.	
			N	9-12	—	—	—	—	—	200 E. L.	
				1-4							

85. Electrical Engineering Laboratory.—Advanced alternating current testing. *I*; (2).

Prerequisite: Electrical Engineering 76; registration in Electrical Engineering 35.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	85	2	KN	—	9	—	—	—	—	207 E. L.	Biegler Moore Davis
			LM	—	8	—	—	—	—	207 E. L.	
			K	—	—	—	—	1-4	—	200 E. L.	
			L	—	—	1-4	—	—	—	200 E. L.	
			M	1-4	1-4	—	—	—	—	200 E. L.	
			N	—	—	—	—	—	8-11	200 E. L.	

86. Electrical Engineering Laboratory.—Advanced alternating current testing. *II*; (2).

Prerequisite: Electrical Engineering 85; registration in Electrical Engineering 36.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	86	2	KM	—	8	—	—	—	—	207 E. L.	Biegler Moore Davis
			LN	—	9	—	—	—	—	207 E. L.	
			K	—	—	—	—	1-4	—	200 E. L.	
			L	—	—	—	—	9-12	—	200 E. L.	
			M	—	1-4	—	9-12	—	—	200 E. L.	
			N	—	1-4	—	—	—	—	200 E. L.	

90. Lighting.—Electric lamps and other illuminants, and their effective use; interior wiring; methods of distribution. (For students in architecture.) *II* (half semester only); (1).

Prerequisite: Junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	90	1	—	—	8	—	8	—	—	221 E. H.	Brooks

92. Lighting and Wiring.—First half of semester same as E. E. 90. Further study of distribution and fusing. Underwriters' rules; motors. (For students in architectural engineering.) *II*; (2).

Prerequisite: Junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	92	2	—	—	8	—	8	—	—	221 E. H.	Brooks

95-96. Seminar.—Electrical railroading; illumination; telegraphy; telephony; storage batteries; electric metallurgy. *I, II*; (1).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	95	1	KLMN	—	—	—	1,2	—	—	206 E. L.	Paine

SECOND SEMESTER											
E. E.	96	1	Schedule the same as for 95 (first semester).								

98. Thesis.—First semester: preliminary reading and investigation; second semester: completion. *II*; (3). *Time to be arranged.*

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

Courses for Graduates

Entrance upon graduate work in electrical engineering presupposes the full undergraduate course in that subject.

101. Advanced Course in Alternating Currents.—The theory of Transient Phenomena; polyphase circuits; measuring apparatus. *Twice a week; I, II; (1½ units). Time to be arranged.* Professor PAINE

103. Electrical Design.—Plans for an electrical machine or apparatus of specified character; or for the arrangement of an electrical plant; or for the installation of such machinery or apparatus. *Twice a week; II; (1 unit). Time to be arranged.* Assistant Professor WALDO

104. Telegraphy and Telephony.—*Once a week; I, II; (1 unit). Time to be arranged.* Professor BROOKS

105. Electrical Engineering Research.—Investigation of electrical phenomena, or tests of some electrical machine, or of a plant of such machines. *Twice a week; I, II; (1 to 3 units). Time to be arranged.* Professor PAINE

106. Illumination.—*Once a week; I, II; (1 unit). Time to be arranged.* Professor BROOKS

ENGINEERING

(See ARCHITECTURE, CIVIL ENGINEERING, DRAWING, ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING, MECHANICS, MINING ENGINEERING, MUNICIPAL AND SANITARY ENGINEERING, PHYSICS, RAILWAY CIVIL ENGINEERING, RAILWAY ELECTRICAL ENGINEERING, and RAILWAY MECHANICAL ENGINEERING.)

THE ENGLISH LANGUAGE AND LITERATURE

(Including CELTIC, RHETORIC, and PUBLIC SPEAKING)

*STUART PRATT SHERMAN, Ph.D., *Professor*

DANIEL KILHAM DODGE, Ph.D., *Professor*

THOMAS ARKLE CLARK, B.L., *Professor*

ERNEST BERNBAUM, Ph.D., *Professor*

EDWARD FULTON, Ph.D., *Associate Professor*

EDWARD CHAUNCEY BALDWIN, Ph.D., *Assistant Professor*

HARRY GILBERT PAUL, Ph.D., *Associate Professor*

FRANKLIN WILLIAM SCOTT, Ph.D., *Assistant Professor, Chairman, and Secretary*

HARRIE STUART VEDDER JONES, Ph.D., *Assistant Professor*

JACOB ZEITLIN, Ph.D., *Assistant Professor*

HERBERT LE Sourd CREEK, Ph.D., *Associate*

CLARENCE VALENTINE BOYER, Ph.D., *Associate*

GERTRUDE SCHOEPPERLE, Ph.D., *Associate*

HARRY FRANKLIN HARRINGTON, A.M., *Associate*

HAROLD M HILLEBRAND, Ph.D., *Associate*

MARTHA JACKSON KYLE, A.M., *Instructor*

CLARISSA RINAKER, Ph.D., *Instructor*

EASLEY STEPHEN JONES, A.M., *Instructor*

MERVIN JAMES CURL, A.M., *Instructor*

ROGER SHERMAN LOOMIS, B.Litt., A.M., *Instructor*

HARRISON McJOHNSTON, A.M., *Instructor*

*On leave of absence.

ROBERT CALVIN WHITFORD, A.M., *Instructor*
 LYNN HAROLD HARRIS, Ph.D., *Instructor*
 ALLENE GREGORY, Ph.D., *Instructor*
 SIGURD OSBORN HUSTVEDT, Ph.D., *Instructor*
 ROBERT BRUCE WEIRICK, A.M., *Instructor*
 HARRY TORSEY BAKER, A.M., *Instructor*
 LEW R SARETT, A.B., *Instructor*
 HAMILTON JEWETT SMITH, A.M., *Instructor*
 JOHN J PARRY, Ph.D., *Instructor*
 HAROLD FARNSWORTH CHILDS, A.M., *Assistant*
 SADA ANNIS HARBARGER, A.M., *Assistant*
 RUTH KELSO, A.M., *Assistant*
 EMERSON GRANT SUTCLIFFE, A.M., *Assistant*
 LEWIS IGNATIUS BREDVOLD, A.M., *Assistant*
 JAMES MANLEY PHELPS, A.B., *Assistant*
 CLYDE BYRON BECK, A.M., *Assistant*
 MYRTLE AMY CRUZAN, A.B., *Assistant*
 CARRYL NELSON THURBER, A.B., *Assistant*
 BEATRICE VIRGINIA COPLEY, A.B., *Assistant*
 FREDERICK IRVIN MYERS, A.M., *Assistant*
 CHESTER CLYDE HARBISON, A.B., *Assistant*
 PAUL NISSLEY LANDIS, A.M., *Assistant*
 GERALD DARFIELD STOPP, A.B., *Assistant*

Major: 20 hours in English excluding Rhetoric 1-2 and English 10, and including at least 10 hours in English literature, at least 3 hours in composition, and at least 1 one-year course, or its equivalent, from the advanced group of courses.

Minor: 20 hours in either (a) one foreign language; or (b) in any two foreign languages; or (c) in one foreign language and philosophy; or (d) in one foreign language and history.

A. ENGLISH LITERATURE AND LANGUAGE

Elementary Courses

1-2. Survey of English Literature.—(Credit is not given for either semester separately, nor for the course in addition to course 10-11 or course 20.) I, II; (4).

Prerequisite: One year of college work.

NOTE.—Registration for lecture and discussion sections on the same day is not permitted.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	1	4	1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	—
			A Discussion	8	—	8	—	—	—	302 U. H.	Hillebrand
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ¹ Discussion	2	—	2	—	—	—	307 U. H.	Hillebrand
			F ² Discussion	2	—	2	—	—	—	314 U. H.	Rinaker
			K Discussion	—	8	—	8	—	—	307 U. H.	Creek
			N ¹ Discussion	—	11	—	11	—	—	308 U. H.	Baldwin
			N ² Discussion	—	11	—	11	—	—	314 U. H.	Schoepperle
			O Discussion	—	1	—	1	—	—	307 U. H.	Fulton

The English Language and Literature

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	2	4	1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	—
			A Discussion	8	—	8	—	—	—	302 U. H.	Hillebrand
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ¹ Discussion	2	—	2	—	—	—	314 U. H.	Rinaker
			F ² Discussion	2	—	2	—	—	—	308 U. H.	Hustvedt
			K Discussion	—	8	—	8	—	—	307 U. H.	Hillebrand
			N ¹ Discussion	—	11	—	11	—	—	314 U. H.	Baldwin
			N ² Discussion	—	11	—	11	—	—	302 U. H.	Schoepperle
			O Discussion	—	1	—	1	—	—	307 U. H.	Hustvedt

10-11. Introduction to Literature.—First Semester: The Forms of Poetry. Second semester: The Forms of Prose Literature. (This course is intended only for those who expect to include a considerable amount of literature, in English or in some other language, in their curriculum. Credit is not given for the course in addition to English 1-2 or 20 nor for the first semester separately. One semester's work is credited toward a major in English.) *I, II; (3).*

Prerequisite: The minimum entrance requirements in English.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	10	3	A	8	—	8	—	8	—	315 U. H.	Paul
			B	9	—	9	—	9	—	302 U. H.	Zeitlin
			C	10	—	10	—	10	—	302 U. H.	Dodge
			D	11	—	11	—	11	—	— U. H.	Baker

SECOND SEMESTER

English	11	2	A	8	—	8	—	8	—	214 U. H.	Loomis
			B	9	—	9	—	9	—	302 U. H.	Zeitlin
			C	10	—	10	—	10	—	302 U. H.	Dodge
			D	11	—	11	—	11	—	214 U. H.	Jones, H.S.V.

12-13. American Literature.—(Credit is not given for either semester separately.) *I, II; (2).*

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	12	2	—	—	1	—	1	—	—	418 U. H.	Paul

SECOND SEMESTER

English	13	2	Schedule the same as for 12 (first semester).								
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17. The English Language.—History, characteristics, and usage of modern English. *I; (3).*

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	17	3	—	2	—	2	—	2	—	117 L. H.	Fulton

20. Chief English Writers.—For those whose program admits of but one semester's work in English, and who therefore may not register for English 1. It is not accepted as a prerequisite for more advanced courses. Credit is not given for the course in addition to English 1 or 10. *I or II; (4).*

Prerequisite: One year of college work.

The English Language and Literature

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	20	4	B	9	9	9	10	—	—	315 U. H.	Harris
			C	10	10	10	10	—	—	418 U. H.	Loomis
			D	11	11	11	11	—	—	315 U. H.	Jones, E. S.
			E	1	1	1	1	—	—	315 U. H.	Boyer
			G ¹	3	3	3	3	—	—	315 U. H.	—
			G ²	3	3	3	3	—	—	214 U. H.	Hustvedt

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
B	9	9	9	9	—	—	—	—	—	315 U. H.	Baker
C	10	10	10	10	—	—	—	—	—	U. H.	Weirick
D	11	11	11	11	—	—	—	—	—	U. H.	Jones, E. S.
E	1	1	1	1	—	—	—	—	—	315 U. H.	Boyer
G ¹	3	3	3	3	—	—	—	—	—	315 U. H.	Boyer
G ²	3	3	3	3	—	—	—	—	—	214 U. H.	Whitford

23. Introduction to Shakespeare.—I or II; (3).

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	23	3	—	2	—	2	—	2	—	315 U. H.	Hillebrand
SECOND SEMESTER											
				2	—	2	—	2	—	315 U. H.	Boyer

Intermediate Courses

Prerequisite: Eleven hours of English literature, or eight hours of English literature and eight hours of a foreign language.

21-22. Literary Study of the Bible.—Hebrew literature as an expression of the life of the race that produced it; the debt, both ethical and artistic, of modern life to ancient Hebrew thought. (Either semester may be taken separately. I, II; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	21	3	—	10	—	10	—	10	—	307 U. H.	Baldwin
SECOND SEMESTER											
English	22	3	Schedule the same as for 21 (first semester).								

24. English Literature of the Victorian Period.—II; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	24	3	—	11	—	11	—	11	—	308 U. H.	Kyle

29. English Literature From 1557 to 1688, Exclusive of the Drama.—I; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	29	8	—	—	10	—	10	—	—	307 U. H.	Baldwin

31. English Literature From 1688 to 1789.—II; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	31	3	—	—	8	—	8	—	—	110 L. H.	Paul

The English Language and Literature

33. English Literature From 1789 to 1837.—I; (3).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	33	3	—	11	—	11	—	11	—	307 U. H.
										Instructor Zeitlin

Courses for Advanced Undergraduates and Graduates

Prerequisite: Sixteen hours of English literature; or junior or senior standing and the approval of the instructor concerned.

3. The Poetry of Milton.—Origins, forms, artistic and ethical values; Milton's place in English literary history. *II*; (3).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	3	3	—	—	10	—	10	—	—	110 L. H.
										Instructor Baldwin

4. History and Principles of English Versification.—I; (2).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	4	2	—	—	10	—	10	—	—	110 L. H.
										Instructor Creek

5. Shakespeare.—Intensive study of a few plays, with special emphasis on *Hamlet*. *II*; (3).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	5	3	—	9	—	9	—	9	—	110 L. H.
										Instructor Dodge

25. Chaucer.—I; (3).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	25	3	—	10	—	10	—	10	—	218 L. H.
										Instructor Jones, H. S. V.

8-9. Old English (Anglo-Saxon).—Grammar; short poems; *Beowulf*. (The first semester may be taken separately.) *I, II*; (3).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	8	3	—	11	—	11	—	11	—	110 L. H.
										Instructor Dodge

English 9 3 Schedule the same as for 8 (first semester).

27-28. Studies in the History of Journalism.—First semester: English literary periodicals and the periodical essay in the Eighteenth Century. Second semester: The magazine in America.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	27	2	—	—	2	—	2	—	—	218 L. H.
										Instructor Scott

English 28 2 Schedule the same as for 27 (first semester).

41-42. Teachers' Course.—Methods of teaching English literature and composition in the high school. (This course is not credited toward advanced degrees, or toward a major in English. Either semester may be taken separately.) *I, II*; (2).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
English	41	2	—	—	3	—	3	—	—	110 L. H.
										Instructor Paul

The English Language and Literature

SECOND SEMESTER

English 42 2 Schedule the same as for 41 (first semester).

18. Modern English Grammar.—Sentence structure and analysis; grammatical categories; peculiarities of English syntax. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	18	3	—	11	—	11	—	11	—	218 L. H.	Zeitlin

32. The Critical Essayists of the 19th Century.—*II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	32	3	—	2	—	2	—	2	—	307 U. H.	Fulton

35-36. The English Drama (Exclusive of Shakespeare).—First Semester: From the beginning to 1600. Second Semester: From 1600 to 1700. (Either semester may be taken for separate credit.) *I, II*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	35	3	—	9	—	9	—	9	—	110 L. H.	Dodge

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	36	3	—	2	—	2	—	2	—	110 L. H.	Hillebrand

37. Folk-Lore.—The elements of imaginative fiction; origins of the lyric and drama; primitive satire and gnomic literature. Superstitions surviving in English literature. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	37	2	—	—	10	—	10	—	—	320 L. H.	Schoepperle

38. The Arthurian Tradition in England.—The historical Arthur. Celtic tales. Old French Romances (in translation). The tradition in England from the early romances to Arnold, with special attention to Malory and Tennyson. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	38	2	—	—	10	—	10	—	—	— L. H.	Schoepperle

39. Introduction to the Literature of the Middle Ages.—European culture from the fourth century; the relation of English and continental literature, to the fourteenth century. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	39	3	—	3	—	3	—	3	—	— L. H.	Creek

45. The Development of the Modern Drama.—Dramatic tendencies in the nineteenth century, both in England and on the Continent; representative readings, and lectures from the standpoint of comparative literature. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	45	3	—	3	—	3	—	3	—	110 L. H.	Hillebrand

60a-60b. Thesis.—Special training in investigation for candidates for honors and for other seniors. *I, II; (1). Time to be arranged.*

Assistant Professor ZEITLIN, Dr. HILLEBRAND, and others.

Courses for Graduates

101. Research in Special Periods.—Competent graduate students are encouraged to seek the advice and assistance of the department of English and to submit to the department plans for study in the language or literature of the periods mentioned below.

A. Anglo-Saxon language and literature

Professor DODGE, Assistant Professor ZEITLIN

B. Thirteenth and Fourteenth Centuries,

Assistant Professor H. S. V. JONES

C. Sixteenth Century

Professor DODGE

D. Seventeenth Century

Assistant Professor BALDWIN

E. Eighteenth Century

Associate Professor PAUL

F. Nineteenth Century

Associate Professor FULTON

108. The English Epic.—The 16th, 17th, and 18th Centuries, from the point of view of classical theory. *I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	108	1 unit	—	—	10	—	10	—	—	218 L. H.	Fulton

110. Old English (Anglo-Saxon) Poetry.—*Twice a week. I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	110	1 unit	—	—	—	—	—	—	—	110 L. H.	Dodge

114. The Development of the Essay.—An examination of the various types of the English essay with reference to Continental influences and classical origins. *I, II; (2).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	114	2	—	—	9	—	9	—	—	218 L. H.	Zeitlin

126. English Ballads and Metrical Romances.—*I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	126	1 unit	—	—	2	—	2	—	—	— L. H.	Schoeppele

128. Spenser and the Beginnings of the English Renaissance.—The persistence of certain medieval traditions reinforced by the Revival of Classical Learning. Catholicism and Calvinism as sources of literary inspiration. *Twice a week. I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	128	1 unit	—	—	9	—	9	—	—	110 L. H.	Jones, H.S.V.

135. Problems in American Literature.—I, II; (1 unit).

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
English	135	1 unit	—	—	2	—	2	—	110 L. H.	Paul

B. CELTIC*

1-2. Celtic Civilization and Literature in Translation.—(Either semester may be taken separately. This course may not be counted towards a major in English.) I, II; (2).

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Celtic	1	2	—	—	1	—	1	—	320 L. H.	Schoepperle

SECOND SEMESTER										
Celtic	2	2	Schedule the same as for 1 (first semester).							

C. RHETORIC

Elementary Courses

*1-2. Rhetoric and Themes.—Required for students in the Colleges of Liberal Arts and Sciences, Commerce, Engineering, and Agriculture. I, II; (3).

Prerequisite: The minimum entrance requirements in English.

NOTE.—A limited number of sections in each semester take up the work of the other semester. The course is not counted toward a major in English.

Students who show in the first two weeks that they are not prepared to do composition work of collegiate grade will be assigned to a special course, parallel to Rhetoric 1, but involving additional work.

FIRST SEMESTER

(The following sections are open only to the students of the Colleges of Liberal Arts and Sciences, Commerce, and Law, the School of Music, and women students of the College of Agriculture.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	A 1	8	—	8	—	8	—	214 U. H.	Cruzan
			A 2	8	—	8	—	8	—	314 U. H.	Hustvedt
			A 3	8	—	8	—	8	—	307 U. H.	Baker
			B 1	9	—	9	—	9	—	307 U. H.	Jones, H. S. V.
			B 2	9	—	9	—	9	—	318 U. H.	Curl
			B 3	9	—	9	—	9	—	314 U. H.	Gregory
			C 1	10	—	10	—	10	—	419 U. H.	Gregory
			C 2	10	—	10	—	10	—	315 U. H.	Myers
			C 3	10	—	10	—	10	—	314 U. H.	Whitford
			D 1	11	—	11	—	11	—	420 U. H.	Baker
			D 2	11	—	11	—	11	—	419 U. H.	Harris
			D 3	11	—	11	—	11	—	314 U. H.	Whitford
			D 6	11	—	11	—	11	—	302 U. H.	Scott
			E 1	1	—	1	—	1	—	307 U. H.	Hillebrand
			E 2	1	—	1	—	1	—	308 U. H.	Weirick
			E 3	1	—	1	—	1	—	204 T. B.	—
			F 1	2	—	2	—	2	—	419 U. H.	—
			F 2	2	—	2	—	2	—	420 U. H.	—
			G 1	3	—	3	—	3	—	307 U. H.	Fulton
			G 2	3	—	3	—	3	—	308 U. H.	Boyer
			K 1	—	8	—	8	—	8	314 U. H.	Landis
			M 1	—	10	—	10	—	10	302 U. H.	Rinaker

*Students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from the first semester's work. The examination for those desirous of meeting this qualification will be given at 7 p. m., September 18, in room 228 N. H.

The English Language and Literature

(The following sections are open only to engineering students.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	A 4	8	—	8	—	8	—	403 P. L.	Sutcliffe
			B 4	9	—	9	—	9	—	204 T. B.	Sutcliffe
			B 5	9	—	9	—	9	—	215 T. B.	Bredvold
			C 4	10	—	10	—	10	—	205 E. H.	Harbarger
			D 4	11	—	11	—	11	—	202 E. H.	Harbarger
			D 5	11	—	11	—	11	—	105 T. B.	Bredvold
			E 4	1	—	1	—	1	—	318 U. H.	Myers
			E 5	1	—	1	—	1	—	205 E. H.	Gilbert
			F 4	2	—	2	—	2	—	202 E. H.	Whitford
			F 5	2	—	2	—	2	—	205 E. H.	Myers
			G 4	3	—	3	—	3	—	202 E. H.	—
			K 4	—	8	—	8	—	8	205 E. H.	Bredvold
			K 5	—	8	—	8	—	8	302 U. H.	Hustvedt
			K 6	—	8	—	8	—	8	214 U. H.	Smith

(The following sections are open only to men students in the College of Agriculture.)

A 8	8	—	8	—	8	—	105 Law	Kelso
A 9	8	—	8	—	8	—	311 U. H.	Copley
A10	8	—	8	—	8	—	420 U. H.	Smith
C 8	10	—	10	—	10	—	207 E. L.	Cruzan
C 9	10	—	10	—	10	—	420 U. H.	Kelso
C10	10	—	10	—	10	—	318 U. H.	—
C11	10	—	10	—	10	—	512 U. H.	Copley
C12	10	—	10	—	10	—	204 T. B.	—
D 8	11	—	11	—	11	—	102 E. H.	Cruzan
L 8	—	9	—	9	—	9	302 U. H.	Weirick
L 9	—	9	—	9	—	9	308 U. H.	Rinaker
L10	—	9	—	9	—	9	314 U. H.	Loomis
L11	—	9	—	9	—	9	419 U. H.	—

(Section Z1 below is for foreign students not versed sufficiently in English to pursue the course in regular sections. Assignments are to be made by permission of Professor Scott.)

Z 1	4	—	4	—	4	—	420 U. H.	Creek
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Sections 01 (8 M W F, 318 U. H.), 02 (10 M W F, U. H., Smith), 03 (9 T T S, 214 U. H., Harbarger), and 04 (11 M W F, 302 U. H., Gregory), are for students whose preparation proves after two weeks' trial in other sections to have been deficient. Assignments to these sections will be made by Professor Scott, and no student will be permitted to register in them on the registration day.

(The following sections of Rhetoric 2 (second semester Rhetoric) will be given during the first semester, and are open to students of all colleges who are irregular in course.)

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	B 1	9	—	9	—	9	—	308 U. H.	Weirick
			B 2	9	—	9	—	9	—	249 N. H.	—
			C 1	10	—	10	—	10	—	214 U. H.	Harris
			D 1	11	—	11	—	11	—	308 U. H.	Kelso
			E 1	1	—	1	—	1	—	208 P. L.	—
			N 1	—	11	—	11	—	11	307 U. H.	Sutcliffe

The English Language and Literature

SECOND SEMESTER

(The following sections are open only to students of the Colleges of Liberal Arts and Sciences, Commerce, and Law, the School of Music, and women students of the College of Agriculture.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	A 1	8	—	8	—	8	—	419 U. H.	Cruzan
			A 2	8	—	8	—	8	—	314 U. H.	Hustvedt
			A 3	8	—	8	—	8	—	307 U. H.	Baker
			B 1	9	—	9	—	9	—	307 U. H.	Jones, H. S. V.
			B 2	9	—	9	—	9	—	318 U. H.	Curl
			B 3	9	—	9	—	9	—	314 U. H.	Gregory
			B 7	9	—	9	—	9	—	— U. H.	—
			C 1	10	—	10	—	10	—	419 U. H.	Gregory
			C 2	10	—	10	—	10	—	314 U. H.	—
			C 3	10	—	10	—	10	—	315 U. H.	Myers
			D 1	11	—	11	—	11	—	420 U. H.	Baker
			D 2	11	—	11	—	11	—	307 U. H.	Harris
			D 3	11	—	11	—	11	—	314 U. H.	Whittford
			D 5	11	—	11	—	11	—	214 U. H.	Cruzan
			D 7	11	—	11	—	11	—	109 U. H.	—
			E 1	1	—	1	—	1	—	308 U. H.	Hillebrand
			E 2	1	—	1	—	1	—	314 U. H.	Harbison
			E 3	1	—	1	—	1	—	214 U. H.	Weirick
			E 6	1	—	1	—	1	—	420 U. H.	—
			F 1	2	—	2	—	2	—	419 U. H.	Boyer
			F 2	2	—	2	—	2	—	420 U. H.	—
			G 1	3	—	3	—	3	—	308 U. H.	Fulton
			K 1	—	8	—	8	—	8	308 U. H.	Landis

(The following sections are open only to students in the College of Engineering.)

A 4	8	—	8	—	8	—	208 P. L.	Myers
A 5	8	—	8	—	8	—	—	Landis
B 4	9	—	9	—	9	—	205 E. H.	Sutcliffe
B 5	9	—	9	—	9	—	204 T. B.	Bredvold
B 6	9	—	9	—	9	—	—	Harbarger
D 4	11	—	11	—	11	—	204 T. B.	Harbarger
E 4	1	—	1	—	1	—	202 E. H.	—
E 5	1	—	1	—	1	—	308 E. H.	Bredvold
F 4	2	—	2	—	2	—	202 E. H.	Whitford
F 5	2	—	2	—	2	—	308 E. H.	Bredvold
G 4	3	—	3	—	3	—	202 E. H.	Myers
G 5	3	—	3	—	3	—	308 E. H.	—
K 4	—	8	—	8	—	8	302 P. L.	Harbarger
L 4	—	9	—	9	—	9	205 E. H.	Hustvedt

(The following sections are open only to men students in the College of Agriculture.)

A 8	8	—	8	—	8	—	418 U. H.	Kelso
A 9	8	—	8	—	8	—	315 U. H.	Copley
A10	8	—	8	—	8	—	420 U. H.	Smith
A11	8	—	8	—	8	—	513 U. H.	—
C 8	10	—	10	—	10	—	513 U. H.	Cruzan
C 9	10	—	10	—	10	—	420 U. H.	Kelso
C10	10	—	10	—	10	—	318 U. H.	—
C11	10	—	10	—	10	—	512 U. H.	Loomis
C12	10	—	10	—	10	—	—	Copley
D 8	11	—	11	—	11	—	—	Weirick
N 8	—	11	—	11	—	11	—	Rinaker
N 9	—	11	—	11	—	11	—	Gregory
N10	—	11	—	11	—	11	—	Loomis

The English Language and Literature

(Section Z below is for foreigners. Assignments are to be made by permission of Professor Scott.)

Z 4 — 4 — 4 — 420 U. H. Creek

(The following sections of Rhetoric 1 (first semester Rhetoric) will be given during the second semester.)

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Rhetoric	1	3	C 1	10	—	10	—	10	—	418 U. H.	Harris
			D 1	11	—	11	—	11	—	318 U. H.	Kelso
			E 1	1	—	1	—	1	—	307 U. H.	—
			K 1	—	8	—	8	—	8	419 U. H.	Sutcliffe
			L 1	—	9	—	9	—	9	420 U. H.	Smith
			M 1	—	10	—	10	—	10	419 U. H.	Smith

Intermediate Courses

***3a. Exposition.**—Themes or topics of general interest; analyses of facts and ideas, literary reviews, and criticisms; informal essays. *I* or *II*; (3).

Prerequisite: Rhetoric 1-2.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Rhetoric	3a	3	—	9	—	9	—	9	—	202 L. H.	Jones, E. S.
			Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
			A 1	8	—	8	—	8	—	—	Kyle
			B 2	9	—	9	—	9	—	—	Jones, E. S.

***3b. Exposition.**—Themes on topics of especial interest to students in engineering, agriculture, science, and commerce. *I* or *II*; (3).

Prerequisite: Rhetoric 1-2.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Rhetoric	3b	3	—	8	—	8	—	8	—	104 P. L.	Curl
			Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
				8	—	8	—	8	—	—	Sutcliffe

***3c. Argument.**—Wide reading on both sides of current questions; writing of briefs and of three long arguments. *I*; (3).

Prerequisite: Rhetoric 1-2.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Rhetoric	3c	3	—	9	—	9	—	9	—	308 L. H.	Loomis

***3d. Description and Simple Narrative.**—*I*; (3).

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Rhetoric	3d	3	—	8	—	8	—	8	—	204 T. B.	Curl

6-7. Narrative Composition.—Practise in short story writing. (Intended for those who have some aptitude for literary work.) *I, II*; (3).

Prerequisite: Two years of college work and the consent of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Rhetoric	6	3	—	3	—	3	—	3	—	117 L. H.	Curl
Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				Schedule the same as for 6 (first semester).							
Rhetoric	7	3	—								

*No more than 6 hours' credit may be earned in Rhetoric 3; to obtain 6 hours, two different types of composition must be elected.

10. Business Writing.—Correspondence; sales letters; practise in writing business reports and summaries. Lectures and discussions. (Not counted toward a major in English.) *I* or *II*; (2).

Prerequisite: Rhetoric 1-2.

NOTE.—Sections A, C₁ and D₁ in the first semester, and A and C₂ in the second, are for the students in the College of Commerce and Business Administration.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	10	2	A	—	8	—	8	—	—	312 Com.	McJohnston
			B	—	9	—	9	—	—	105 Law	Warnock
			C 1	—	10	—	10	—	—	312 Com.	McJohnston
			C 2	—	10	—	10	—	—	104 P. L.	Thurber
			D 1	11	—	11	—	—	—	308 Com.	McJohnston
			D 2	—	11	—	11	—	—	302 U. H.	Creek
			D 3	—	11	—	11	—	—	105 Law	Thurber

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	12	3	A	—	8	—	8	—	—	312 Com.	McJohnston
			B	—	9	—	9	—	—	105 Law	Warnock
			C 1	—	10	—	10	—	—	312 Com.	Thurber
			C 2	—	10	—	10	—	—	315 U. H.	Harris
			C 3	10	—	10	—	—	—	308 Com.	McJohnston
			D 1	—	11	—	11	—	—	307 U. H.	Creek
			D 2	—	11	—	11	—	—	— U. H.	Thurber

12. The Collecting and Writing of News.—Drill in gathering news; exercises and assignments in writing the news-story; the various types of newspaper narratives; news values considered with the aid of representative newspapers on file in the laboratory. *I*; (3).

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	12	3	A	9	—	9	—	9	—	105 Law	Harrington
			B	1	—	1	—	1	—	105 Law	Harrington

13. The Newspaper.—(A continuation of Rhetoric 12.) Interviewing and newspaper correspondence; the organization and mechanical details of the newspaper. Practise in writing for newspapers. *Six laboratory periods and three lectures a week.* *II*; (3).

Prerequisite: Rhetoric 1-2, 12.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	13	3	A	9	—	9	—	9	—	105 Law	Harrington
			B	1	—	1	—	1	—	105 Law	Harrington

22. Summarizing and Briefing.—Summarizing, briefing, and making reports; abstracts of correspondence on file; summarizing of commercial and economic data for the solution of business problems. (For students in the College of Commerce and Business Administration.) *II*; (2).

Prerequisite: Rhetoric 10.

The English Language and Literature

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	22	2	—	—	10	—	10	—	—	307 Com.	McJohnston

25-26. Senior Conferences (Courses in Commerce and Business Administration).—Each senior is required to present all papers written during the year for review and criticism. Rewriting may be required if they are open to serious criticism. (Required of all seniors in the College of Commerce and Business Administration.) *I, II; (1).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	25	1	A	—	11	—	—	—	—	308 Com.	McJohnston
			B	—	—	—	11	—	—	308 Com.	McJohnston

SECOND SEMESTER

Rhetoric	26	1	—	Schedule the same as for 25 (first semester).							
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19. Agricultural News Writing.—Class exercises; lectures; assignments in gathering and preparing material for agricultural papers. *II; (3).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	19	3	—	—	3	—	3	—	—	302 U. H.	Scott

Courses for Advanced Undergraduates and Graduates

15-16. Editorials and Special Articles.—Sources and treatment of material for editorials and articles; the interpretation of news; journalistic backgrounds; the relation of current events to the social sciences. Assigned readings; preparation of editorials, articles, and reviews. *I, II; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	15	3	—	2	—	2	—	2	—	211 U. H.	Scott

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	16	3	—	Schedule the same as for 15 (first semester).							

17. Advanced Composition.—The study of structure; criticism of current periodical literature; development of material for reports and magazine articles. (Open to a limited number of students, and only on recommendation.) *II; (3).*

Prerequisite: Two years of college work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	17	3	—	10	—	10	—	10	—	U. H.	—

26-27. Editorial Practise.—Practical training in the reading of "copy", writing of headlines, making up, editorial supervision, proof reading, and type setting. *Five hours' work on the desk and one lecture a week. I, II; (3).*

Prerequisite: Rhetoric 12, 13, or the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	26	3	—	(Arrange)						103 Law	Harrington

SECOND SEMESTER

Rhetoric	27	3	—	Schedule the same as for 26 (first semester).							
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28. Newspaper Problems and Policies.—The relation of the newspaper to the public. *I*; (2).

Prerequisite: Rhetoric 26-27.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	28	2	—	—	10	—	10	—	—	105 Law	Harrington

29. Making a Country Newspaper.—Discussions intended primarily for seniors who expect to enter the country field. A study of small town conditions; problems affecting rural newsgathering; country correspondence; circulation; advertising; business efficiency; print-shop equipment. Special investigations by members of the class. *II*; (2).

Prerequisite: Junior or Senior Standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	29	2	—	—	10	—	10	—	—	105 Law	Harrington

D. PUBLIC SPEAKING

1. Oral Expression.—Theory and practise of elocution and expression, for public and private address. *I*; (2).

NOTE.—Credit is not given for this course unless it is followed by Public Speaking 2 or 10.

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	1	2	A	1	—	1	—	—	—	418 U. H.	Harbison
			B	—	1	—	1	—	—	318 U. H.	—
			C	1	—	1	—	—	—	419 U. H.	Phelps
			D	2	—	2	—	—	—	318 U. H.	Phelps
			E	—	1	—	1	—	—	419 U. H.	Phelps
			F	—	2	—	2	—	—	318 U. H.	Phelps
			G	3	—	3	—	—	—	318 U. H.	Harbison
			H	—	3	—	3	—	—	318 U. H.	Phelps
			I	1	—	1	—	—	—	314 U. H.	—
			J	—	2	—	2	—	—	211 U. H.	—
			K	11	—	11	—	—	—	208 U. H.	Harbison
			L	—	11	—	11	—	—	211 U. H.	—
			M	—	10	—	10	—	—	211 U. H.	—

2. Extemporaneous Speaking.—Discussion of topics of current interest, assigned and chosen; adaptation of speaking manner to subject matter, length, and attendant circumstances of the address; cultivation of facility in thinking on the platform. *II*; (2).

Prerequisite: Public Speaking 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	2	1	A	1	—	1	—	—	—	418 U. H.	—
			B	—	1	—	1	—	—	318 U. H.	—
			C	1	—	1	—	—	—	419 U. H.	—
			D	2	—	2	—	—	—	418 U. H.	Phelps
			E	—	1	—	1	—	—	419 U. H.	Harbison
			F	—	2	—	2	—	—	318 U. H.	Harbison
			G	11	—	11	—	—	—	U. H.	—
			H	—	11	—	11	—	—	U. H.	—
			M	3	—	3	—	—	—	U. H.	Harbison

The English Language and Literature

3. Argumentation.—Theory of argumentative discourse, for the cultivation of ability in meeting the contentions of an opponent; briefing, speech-writing, criticism of the literature of debate; text and exercises. *I*; (3).

Prerequisite: Public Speaking 1 and 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	3	3	A	2	—	2	—	2	—	418 U. H.	Sarett
			B	3	—	3	—	3	—	418 U. H.	Sarett

4. Debate.—Application of the principles of argumentation to the spoken debate; team and individual competition; debates on current issues. *II*; (3).

Prerequisite: Public Speaking 3.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	4	3	A	2	—	2	—	2	—	318 U. H.	Sarett
			B	3	—	3	—	3	—	318 U. H.	Sarett

5. Persuasion.—The winning of individuals and audiences by means of written and spoken appeal; primarily a study in matter, with secondary attention to appropriate platform manner and methods. *I*; (2).

Prerequisite: Public Speaking 1 and 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Public Speaking	5	2	A	2	—	2	—	—	—	320 U. H.	Harbison
			B	—	2	—	2	—	—	320 U. H.	Sarett
			C	—	3	—	3	—	—	314 U. H.	Harbison

6. The Forms of Public Address.—Types and modes of speeches; speech style, criticism, and a study of standards; practise in using various forms. *II*; (2).

Prerequisite: Public Speaking 1 and 2.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Public Speaking	6	2	A	—	2	—	2	—	—	320 U. H.	Sarett

7. A Study of Orators and Oratory.—The lives, times, and works of distinguished speakers; required readings and reports, chiefly oral in the form of speeches; discussions, topical speeches, and declamations. *I*; (2).

Prerequisite: Public Speaking 1 and 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	7	2	—	—	3	—	3	—	—	320 U. H.	Sarett

10. Interpretation and Dramatization of Literature.—Oral interpretation of standard literature; the interpretation and staging of plays. *II*; (2).

Prerequisite: Public Speaking 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Public Speaking	10	2	G	8	—	3	—	—	—	320 U. H.	Phelps
			H	—	3	—	3	—	—	320 U. H.	Phelps
			I	1	—	1	—	—	—	U. H.	Phelps
			J	—	1	—	1	—	—	U. H.	Phelps

ENTOMOLOGY

STEPHEN ALFRED FORBES, Ph.D., LL.D., *Professor*
 ALEXANDER DYER MACGILLIVRAY, Ph.D., *Associate Professor*
 JUSTUS WATSON FOLSOM, D.Sc., *Assistant Professor*
 ROBERT DOUGLAS GLASGOW, Ph.D., *Instructor*
 EDNA MOSHER, Ph.D., *Instructor*
 CHARLES STOCKMAN SPOONER, A.B., *Assistant*
 JACOB RAY STEAR, B.S., *Assistant*

Major: 20 hours from courses offered in the department, except Entomology 1, 4, and 16.

Minors: 20 hours in botany, physiology, zoology, horticulture, and agronomy (see page 21).

Beginning courses open to freshmen and without prerequisites are 1a-1b, and 4. Course 1a-1b may be followed by 2 or 3, and course 15 by 7. Course 3 is not open to freshmen, and courses 5 and 15 are not open to freshmen or sophomores. Students preparing for service as economic entomologists should take as many of the courses offered as possible, including, especially, 2, 3, 4, 7, 8a-8b, and 108. Those preparing for the teaching of zoology should take either 2 and 4, 3 and 4, or 15 and 4.

1a-1b. Elementary Entomology.—Lectures; laboratory; field work. (Open to all students. Not applicable on group requirements of the College of Liberal Arts and Sciences unless both semesters are taken.) *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	1a	2	A	1,2	—	1,2	—	—	—	N. H.	Folsom
			B	—	1,2	—	1,2	—	—	N. H.	Glasgow

SECOND SEMESTER

Entomology 1b 2 — Schedule the same as for 1a (first semester).

2. General Entomology.—Field entomology; morphological and physiological entomology; the collection and preservation of specimens; laboratory studies of typical insects; the recognition of adaptive structures and their utilities. (This course, taken with entomology 3, forms a year's work, covering the whole field, but either may be taken separately.) *I; (5).*

Prerequisite: Entomology, 1a-1b, or 4, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	2	5	—	10,11	10,11	10,11	10,11	10,11	—	405 N. H.	Folsom Glasgow

3. General Entomology.—Classification and determination of insects; study of life histories in the insectary and by field observation; collection of information on the ecological relations of insects. *II; (5).*

Prerequisite: Entomology, 1a-1b, or 4, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	3	5	—	10,11	10,11	10,11	10,11	10,11	—	405 N. H.	Folsom Glasgow

Entomology

4. Introduction to Economic Entomology.—Lectures; field work; laboratory. (Primarily for students in the College of Agriculture; it may not be counted for satisfaction of group requirements in the College of Liberal Arts and Sciences.) *I* or *II*; (3).

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	4	3	A	8,9	—	8,9	—	8,9	—	N. H.	Folsom
			B	9,10	—	9,10	—	9,10	—	N. H.	Glasgow

5. Introduction to Research.—Preparation for thesis work. Library, language, manuscript, and advanced laboratory work on assigned topics. Three hours in this course are required as a preparation for entomological thesis work. *I*; *(3 to 5). *Time to be arranged.*

Associate Professor MACGILLIVRAY, Assistant Professor FOLSOM

Prerequisite: Entomology 2, 3; or 15, 7.

6a-6b. Thesis Investigation.—Subjects selected during the junior year. Three hours a day given to investigation, under the supervision of an instructor during the senior year. *I, II*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY, Assistant Professor FOLSOM

7. Systematic Entomology.—The external anatomy of insects; terminology of the parts; identification of specimens representing as many as possible of the major groups. *II*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2, or 15.

8a-8b. Advanced Economic Entomology.—Assigned problems. Field laboratory, insectary, library, and manuscript work, with practise in the operations of economic entomology. (Intended to prepare students for service as entomologists in experiment stations and other state and government positions. Agronomy 7 and Horticulture, 1, 2, and 3 should also be taken as a part of this preparation.) *I, II*; (3).

Prerequisite: Entomology 4, 2, 3, or 4, 15.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Entomology	8a	3	—	1,2	—	1,2	—	1,2	—	405 N. H.	Folsom

SECOND SEMESTER											
Entomology	8b	3	—	Schedule the same as for 8a (first semester).							

9. Advanced Systematic Entomology.—The identification of the characters upon which genera and species are based. *I*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2 or 15, and 7.

10. Taxonomy of Immature Insects.—*I*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2 or 15, and 7.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

11. Classification of the Coccidæ.—Methods of preparing scale insects for study, the identification of genera and species, and discussion of their morphology, metamorphosis, and phylogeny. *II; (5). Time to be arranged.*

Associate Professor MACGILLIVRAY

Prerequisite: Entomology 2 or 15, and 7.

12a-12b. Current Literature.—Reports and discussion upon assigned topics; presentation and discussion of contents of recent entomological publications, and of results of personal research. *I, II; (1).*

Prerequisite: One year of work in entomology.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	12a	1	—	4	—	—	—	—	—	405 N. H.

SECOND SEMESTER										
Entomology	12b	1	—	Schedule the same as for 12a (first semester).						

13. Medical Entomology.—Insects and the transmission of disease; methods of control and prevention. (Primarily for advanced students preparing for medicine.) *II; (3).*

Prerequisite: Zoology 3, or its equivalent in microscopical technique.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	13	3	—	9	—	9	—	9	—	N. H.

(Arrange three additional hours.)

15. Introductory Course.—The metamorphosis and development of insects, characteristics of the orders, suborders, and more important families; the habits of representative species; the anatomy of immature and adult insects; identification of special adaptive structures, and the classification of insects. Lectures, quiz, field or laboratory. (Not open to students who have had courses 2 and 3. Those who have had only one of the above courses may take this course for half credit only.) *I; (5).*

Prerequisite: Two years of university work.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	15	5	—	10	—	10	—	10	—	229 N. H.

MacGillivray
Mosher

(Arrange time for laboratory.)

16. Apiculture.—The essentials of bee-keeping. Practical operations; laboratory observations; collateral reading. *II; (2).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	16	2	—	—	1,2	—	1,2	—	—	Insectary

Folsom

17a-17b. Insect Organogeny.—More important systems of organs of adult and immature insects. Laboratory. *I, II; (3). (½ unit.) Time to be arranged.*

Associate Professor MACGILLIVRAY, Dr. MOSHER

Prerequisite: Entomology 7 and 9; senior standing.

18a-18b. Insect Taxonomy.—Structures used in the classification of insects and the identification of a representative collection of insects. Laboratory. *I, II; (5). Time to be arranged.*

Dr. MOSHER

Prerequisite: Three years of university work.

Courses for Graduates

The prerequisite for graduate work in entomology is one year's work in biological courses, including an equivalent of either Zoology 1 or Entomology 1a-1b, or 4. Entrance upon major work in entomology requires the equivalent of Entomology 2 and 3.

Graduate students who have had at least one year of college work in biological courses may take for graduate credit any of the preceding courses except 1a-1b, 2, 3, 4, 6a-6b, and 13. The following courses are open to graduate students only.

102. Research in the Morphology and Embryology of Insects.—*Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Assistant Professor FOLSOM

108. Research in Economic Entomology.—*Once or twice a week; I, II; (1 or 2 units). Time to be arranged.*

Assistant Professor FOLSOM

109. Research in Systematic Entomology.—*Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Associate Professor MACGILLIVRAY

FINE ARTS

(See ART AND DESIGN and MUSIC. Attention is called also to the courses in ESTHETICS offered by the departments of PHILOSOPHY, EDUCATION, ARCHITECTURE, and HOUSEHOLD SCIENCE.)

FLORICULTURE

(See HORTICULTURE.)

FRENCH

(See ROMANCE LANGUAGES AND LITERATURE.)

GEOLOGY

(Including MINERALOGY, PALEONTOLOGY, and PHYSICAL GEOGRAPHY)

ELIOT BLACKWELDER, Ph.D., *Professor*

CHARLES WESLEY ROLFE, M.S., *Professor*

WILLIAM SHIRLEY BAYLEY, Ph.D., *Professor*

THOMAS EDMUND SAVAGE, Ph.D., *Associate Professor*

FRED HALL KAY, B.S., *Lecturer (Assistant State Geologist)*

JOHN LYON RICH, Ph.D., *Instructor*

FRANCIS MAURICE VAN TUYL, Ph.D., *Instructor*

CLARENCE SAMUEL ROSS, A.M., *Assistant*

HENRY METHUSALEM DUBOIS, A.M., *Assistant*

LUTHER EUGENE KENNEDY, A.M., *Assistant*

Major: One of the elementary courses (1, 3, 13, 5, 35, or 40), followed by 20 hours, in one of the following fields: (a) general geology, (b) paleontology, (c) mineralogy and petrography, (d) geography. For these the following sequences of courses are suggested: (a) 1, or 3, or 13, 5, 5a, 36, 15, 23, 9, 16, 17; (b) 40, 1 or 3, 16, 17, 22; (c) 1, 3 or 13, 5, 5a, 15, 6, 7, 2; (d) 35, 23, 37, 11, 10, 8, 14 and 24.

Credit will be given for only one of courses 1, 3, and 13, and only two hours' credit in course 35 to students who have taken either 1 or 3, or vice versa. Not more than two of the six elementary courses may be counted in the 20 hours required.

Minors: 20 hours selected from any one or two of the following departments: astronomy, botany, chemistry, entomology, and zoology.

Courses for Undergraduates

1. General Geology.—The material and structure of the earth, the processes of change at work upon and within it, and a brief summary of its history. Four hours discussion; two hours laboratory; two field trips. Not open to students who have had Geology 3 or 13. *I* or *II*; (5).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	1	5	A	9	9	9	9	—	—	247 N. H.	Blackwelder Kennedy Van Tuyl
			B	—	2	2	2	2	—	247 N. H.	
			Laboratory 2,3	—	—	—	2,3	—	251 N. H.		
SECOND SEMESTER											
				9	9	9	9	2,3	—	247 N. H.	Blackwelder Kennedy

3. Elementary Geology.—Topics of general interest in physical, historic, and economic geology and mineralogy. Lectures; laboratory; field work; occasional excursions on Saturdays. Not open to students who have had Geology 1. *I*; (5).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	3	5	—	10,11	10,11	10,11	10,11	10,11	10,11	249 N. H.
										Rolfe Kennedy

35. General Physiography.—Features and processes of the lands, oceans, and atmosphere. Recitations; laboratory; one or two Saturday field trips. Students who have had Geology 1 or 3 will receive only two hours' credit in Geology 35. *I* or *II*; (5).

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	35	5	—	8	8	8	8	—	—	247 N. H.
										Rich

1,2 or 1,2

5. General Mineralogy.—The commoner minerals of scientific and economic importance; includes some crystallography and blow-pipe analysis. Lectures; laboratory. *I*; (5).

Prerequisite: Chemistry 1 and 2, or equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	5	5	—	8,9	8,9	8,9	8,9	8,9	8,9	147 N. H.
										Bayley Ross

5a. Rock-Forming Minerals.—(A continuation of course 5.) The silicate minerals. Lectures; laboratory. *II*; (3).

Prerequisite: Geology 5.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	5a	3	—	(Arrange)						147 N. H.	Van Tuyl
											Rosa

Geology

22. History of Organic Evolution.—The evolution of plants and animals, as indicated by the fossil record. *II*; (3).

Prerequisite: Geology 1 or 3, or Zoology 1, or Botany 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	22	3	—	—	—	8	—	8	—	238 N. H.	Savage

Laboratory (2 hours, arrange).

13a. Physical Geology.—Minerals and rocks. Especially for students in technical courses. Lectures; laboratory. *I*; (3).

Prerequisite: Chemistry 1, 2a; Physics 1a-1b, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13a	3	A	10,11	—	10,11	—	10,11	—	247 N. H.	Van Tuyl
			B	10	3,4	—	3,4	10	—	—	Ross

13b. Physical Geology.—Dynamic and structural geology. Lectures; laboratory. *II*; (3).

Prerequisite: Geology 13a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13b	3	—	10,11	—	10,11	—	10,11	—	247 N. H.	Bayley Ross

12. Geology of Soils.—Geological processes concerned in soil formation; origin of the various classes of soils; mineral compositions; physical characteristics; transformations. Occasional excursions on Saturdays. (For students of agriculture and others interested in plant growth.) *II*; (5).

Prerequisite: Chemistry 1 or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	12	5	—	1,2	1,2	1,2	1,2	1,2	—	249 N. H.	Rolfe Kennedy

14. Meteorology.—The atmosphere and its processes; ocean currents; climate, weather and forecasting. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	14	3	—	1,2	—	1,2	—	1	—	249 N. H.	Rolfe

2. Economic Geology.—The origin and distribution of the important mineral deposits of North America. Lectures; recitations. *II*; (3).

Prerequisite: Geology 1 and 5, or 13b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	2	3	—	3	—	3	—	3	—	150 N. H.	Van Tuyl

36. Petrology.—Practise in the laboratory and field identification of the common rocks. Laboratory. *II*; (2).

Prerequisite: Geology 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	36	2	—	—	1,2	—	1,2	—	—	147 N. H.	Van Tuyl

8. Geography of Europe.—The effect of the physiographic features of Europe on its climate, resources, population and industries. *II*; (3).

Prerequisite: Geology 1, 3, or 35.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	8	3	—	10,11	—	10	—	10,11	—	249 N. H.	Rolfe

10. Geography of Central and South America.—Similar to geology 8. *II*; (3).

Prerequisite: Geology 1, 3, or 35.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	10	3	—	10	—	10	—	10	—	126 N. H.	Rich
							1,2				

[11. Geography of North America.—Similar to geology 8 and 10. Lectures; reading; map study. *II*; (3). Not given in 1916-17. Given in 1917-18 and alternate years.

Prerequisite: Geology 1, 3, or 35.]

37. Principles of Geography.—The influence of topography and climate upon human life and history. Recitations. *I*; (3).

Prerequisite: Geology 1, 3, or 35.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	37	3	—	11	—	—	—	11	—	126 N. H.	Rich

Laboratory (2 hours, arrange).

[38. Regional Geology of North America.—The characteristics of individual geologic provinces. Recitations. *II*; (3). Not given in 1916-17. Given in 1917-18 and alternate years.]

39. Geology of Illinois.—The stratigraphy, structure, geologic history, and resources of the state. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	39	3	—	10	—	10,11	—	10	—	238 N. H.	Savage

19. Field Geology.—Excursion to some important district within 300 miles of Urbana during the Easter recess. The cost of the trip will be about \$30.00. Credit on basis of written report. *II*; (1).

Prerequisite: Geology 1, 3, 13b, or 35. Members of the department

19a. Field Geology.—Students who have had Geology 19 and wish to visit another locality the following year should register for 19a. The conditions are the same as for 19. *II*; (1). Members of the department

Courses for Advanced Undergraduates and Graduates

NOTE.—Junior standing is required for these courses.

6. Optical Mineralogy.—Introduction to the microscopic study of minerals, by means of their behavior in polarized light. Lectures; laboratory. *I*; (3).

Prerequisite: Geology 13a or 5.

Geology

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	6	3	—							251 N. H.	Bayley Ross

7. Petrography.—The principles learned in Geology 6 applied to the study of rocks. The different types of rocks; their origin and classification. Study of representative suite of specimens in the hand specimen and thin section. *II*; (3).

Prerequisite: Geology 6.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	7	3	—							251 N. H.	Bayley Ross

9. Invertebrate Paleontology.—The more important fossils, studied in biological groups. Lectures; laboratory. *I*; (5).

Prerequisite: Geology 1 or 3; or 12 hours in zoology.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	9	5	—	1,2	8	1,2	8	1,2	—	238 N. H.	Savage Du Bois

23. Physiography of the Lands.—The making of topographic features as controlled by such factors as climate and rock structure. Physiographic history. Recitations; laboratory; two Saturday field trips. *II*; (3).

Prerequisite: Geology 1, 3, 13b or 35.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	23	3	—	11	—	—	—	11	—	126 N. H.	Rich

Laboratory (2 hours, arrange)

15. Structural Geology.—Rock deformation and its results. Discussions; laboratory. *II*; (3).

Prerequisite: Geology 1, 3, or 13b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	15	3	—	—	3	—	3	—	—	241 N. H.	Blackwelder

16. Stratigraphy.—The successive geologic formations and the fossil faunas by which they are correlated, with special reference to the United States. *II*; (5).

Prerequisite: Geology 9 or 40.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	16	5	—	9	9,10	9	9,10	9	—	238 N. H.	Savage Du Bois

[17. Earth History.—Physical conditions and events in the geological periods, with special reference to North America; a brief review of the evolution of life. Discussions; lectures. *II*; (3). Not given in 1916-17. Given in 1917-18 and in alternate years.

Prerequisite: Geology 16.]

[21. **Geology of Coal.**—The nature, origin, occurrence, and distribution of coal deposits. *II*; (2). Not given in 1916-17. Given in 1917-18 and alternate years.

Prerequisite: Geology 2 and 16.]

[24. **Physiographic Interpretations.**—The application of physiographic principles to the interpretation of recent earth history. *I*; (3). Not given in 1916-17. Given in 1917-18 and alternate years.

Prerequisite: Geology 23.]

31. **Geology of Oil and Gas.**—Origin and relations of the natural hydrocarbons; their distribution in space and in rock sequence. A two-day trip to the main oil fields of Illinois will be required, involving an expense of about \$10.00. *II*; (3). Given in 1916-17 and alternate years.

Prerequisite: One year of geology including Geology 1 or 3 or 13b, and junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	31	3	Lecture	2	—	2	—	—	—	249 N. H.	Kay
			Laboratory				(Arrange)				

41. **Advanced Field Geology.**—The detailed survey and analysis of a selected district. Professional standards in both work and report will be required. For 1917 the field will probably be in eastern Wyoming. Party limited to ten, approved in advance. *Ten weeks in the summer*; (10).

Professor BLACKWELDER

Prerequisite: Geology 15, 36, and 16, or equivalent.

45a-45b. **Geological Conference.**—All members and advanced students of the department participate in this for the purpose of considering the results of investigations, reviews of important publications, and special lectures. Credit given only to those advanced students authorized to register for the course. *I, II*; (1).

Prerequisite: An elementary course in geology.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	45a	1	—	—	—	—	—	4	—	241 N. H.	Blackwelder

SECOND SEMESTER

Geology	45b	1	Schedule the same as for 45a (first semester).—								
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Courses for Graduates

For graduate work in geology the student must have a thoro training in the principles of the science, and must have done advanced work in at least one of its branches. Except in unusual cases, which will be decided on their merits, at least 20 hours of geology and two or more weeks of field experience will be required. Graduate students with adequate technical preparation in other sciences may be admitted to graduate courses in certain subjects, such as crystallography and the history of organic evolution.

101. **Advanced Crystallography.**—Methods used in measuring, projecting, and calculating crystal forms, and determining the physical properties of crystallized bodies. *Three to five times a week*; *I, II*; (1 unit). *Time to be arranged.*

Professor BAYLEY

[102. **Igneous Petrography.**—The igneous rocks, identification of types, classification, and relationships. Lectures; laboratory. *Twice a week; I, II; (1 unit).*] Not given in 1916-17.

[103. **Metamorphic Petrography.**—Microscopic study of the metamorphic rocks and the interpretation of their origin. *Twice a week; I, II; (1 unit).* Not given in 1916-17. Given in 1917-18 and alternate years. Professor BAYLEY]

105. **Paleontologic Problems.**—The study of fossil invertebrates, either by zoological groups or by geological periods. *One to three times a week; I, II; (1 unit).* Time to be arranged. Associate Professor SAVAGE

[107. **Structural Problems.**—Interpretation of selected districts; based on geologic maps and other field data. *Once a week; I, II; (1 unit).* Not given in 1916-17. Given in 1917-18 and alternate years.]

108. **Ore Deposition.**—Problems in the origin of ore deposits, as illustrated by selected mining districts. *Three times a week; I, II; (1 unit).* Time to be arranged. Professor BAYLEY

[125. **Sedimentation.**—The interpretation of sedimentary rocks in terms of their origin. *Twice a week; I, II; (1 unit).* Not given in 1916-17. Given in 1917-18 and alternate years. Professor BLACKWELDER]

[126. **Historical Problems.**—Critical study of important questions of geologic history. *Twice a week; I, II; (1 unit).* Not given in 1916-17. Professor BLACKWELDER]

135. **Research.**—Individual work under the supervision of members of the staff in their respective fields. *Once a week; I, II. Time to be arranged.* Professor BLACKWELDER, Professor BAYLEY, Associate Professor SAVAGE, Dr. RICH

136. **Seminar in Physical Geology.**—Special problems in mineralogy, petrography, economic geology, metamorphism, and related subjects. *Once a week; I, II; (1 unit).* Time to be arranged. Professor BAYLEY

137. **Seminar in Historical Geology.**—Special problems in historical geology, paleontology, correlation, and allied subjects. *Once a week; I, II; (1 unit).* Time to be arranged.

Professor BLACKWELDER, Associate Professor SAVAGE

GERMANIC LANGUAGES AND LITERATURE

(Including SCANDINAVIAN.)

JULIUS GOEBEL, PH.D., Professor

OTTO EDUARD LESSING, PH.D., Professor

GEORGE TOBIAS FLOM, PH.D., Associate Professor, Scandinavian

NEIL CONWELL BROOKS, PH.D., Assistant Professor

LEONARD BLOOMFIELD, PH.D., Assistant Professor, Comparative Philology

JOSEPH EUGENE GILLET, PH.D., Associate in German and Comparative Literature

CHARLES ALLYN WILLIAMS, PH.D., Associate

DAISY LUANA BLAISDELL, A.M., Instructor

ARMIN HAJMAN KOLLER, PH.D., Instructor

HEINRICH WALDEMAR NORDMEYER, PH.D., *Instructor*
 OSCAR FRIEDRICH WILHELM FERNSEMER, PH.D., *Instructor*
 MAXIMILIAN J RUDWIN, PH.D., *Instructor*
 BERNHARD UHLENDORF, A.M., *Assistant*
 HERMANN H WIEBE, A.M., *Assistant*

GERMAN

Major: 20 hours in German, excluding German 1, 2, and 3, and including at least 6 hours of primarily fourth-year courses.

Minors: 20 hours in not more than two subjects chosen from the following list: languages, education, history, philosophy, and psychology, provided that 8 hours must be selected from a language other than German.

GERMANIC LANGUAGES

Major: 20 hours in German and the Scandinavian languages, provided that at least 8 hours must be in German and 8 hours in one Scandinavian language. Only German courses above the second year, and Scandinavian courses exclusive of Scandinavian 6 and 12 will be acceptable.

Minors: 20 hours in not more than two subjects chosen from the following list: languages, education, history, philosophy, and psychology.

A. GERMAN

First-Year Courses

1. Elementary Course.—Grammar and easy reading for beginners. (Two sections are offered in the second semester for students who enter the University in the second semester.) *I* or *II*; (4).

FIRST SEMESTER													
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor		
German	1	4	A	—	8	8	8	8	—	312 U. H.	Bloomfield		
			B	—	9	9	9	9	—	212 U. H.	Brooks		
			C	—	10	10	10	10	—	311 U. H.	Koller		
			D	—	11	11	11	11	—	213 U. H.	Gillet		
			E	1	1	1	1	—	—	312 U. H.	Uhlendorf		
			F	2	2	2	2	—	—	310 U. H.	Fernsemer		
			G	3	3	3	3	—	—	312 U. H.	Blaisdell		
			(For Students in Engineering)										
			H	—	11	11	11	11	—	—	310 U. H.	Nordmeyer	
I	2	2	2	2	—	—	—	213 U. H.	Rudwyr				

SECOND SEMESTER										
			A	—	8	8	8	8	—	212 U. H.
			B	—	9	9	9	9	—	312 U. H.

2. Narrative Prose.—Grammar and reading. *I*; (4).

Prerequisite: One year of high school German or German S 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
German	2	4	A	—	8	8	8	8	—	213 U. H.
			B	—	11	11	11	11	—	312 U. H.
			C	1	1	1	1	—	—	212 U. H.
			D	3	3	3	3	—	—	212 U. H.

3. Narrative Prose.—(Continuation of German 1.) Reading and grammar. *II*; (4).

Prerequisite: German 1.

Germanic Languages and Literature

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	3	4	A	—	8	8	8	8	—	311 U. H.	Bloomfield
			B	—	9	9	9	9	—	212 U. H.	Brooks
			C	—	10	10	10	10	—	310 U. H.	Fernsemer
			D	—	11	11	11	11	—	213 U. H.	Gillet
			E	1	1	1	1	—	—	213 U. H.	Uhlendorf
			G	3	3	3	3	—	—	212 U. H.	Koller
			(For Students in Engineering)								
			H	—	11	11	11	11	—	310 U. H.	Nordmeyer
			I	2	2	2	2	—	—	310 U. H.	Rudwin

Second-Year Courses

4. Prose Reading.—Selections from standard prose writers; sight reading; composition. *I or II*; (4).

Prerequisite: German 2 or 3, or two years of high school German.

FIRST SEMESTER

NOTE.—Sections E and H are *honor sections* to which students are admitted only by special permission from the department.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	4	4	A	—	8	8	8	8	—	310 U. H.	Uhlendorf
			B	—	9	9	9	9	—	213 U. H.	Uhlendorf
			C	—	10	10	10	10	—	312 U. H.	Williams
			D	—	10	10	10	10	—	213 U. H.	Gillet
			*E	—	11	11	11	11	—	212 U. H.	Koller
			F	—	11	11	11	11	—	311 U. H.	Bloomfield
			G	1	1	1	1	—	—	310 U. H.	Fernsemer
			*H	2	2	2	2	—	—	312 U. H.	Blaisdell
			I	2	2	2	2	—	—	212 U. H.	Nordmeyer
			J	3	3	3	3	—	—	213 U. H.	Rudwin

SECOND SEMESTER

A	—	8	8	8	8	—	310 U. H.	Wiebe
B	—	11	11	11	11	—	312 U. H.	Blaisdell
C	1	1	1	1	—	—	312 U. H.	Wiebe
D	3	3	3	3	—	—	312 U. H.	Uhlendorf

5. Narrative and Historical Prose.—At the option of the instructor one classic in verse may also be read. Composition. *I or II*; (4).

Prerequisite: German 4, or three years of high school German.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	5	4	A	—	10	10	10	10	—	310 U. H.	Nordmeyer
			B	—	11	11	11	11	—	512 U. H.	Rudwin
			C	1	1	1	1	—	—	311 U. H.	Williams

SECOND SEMESTER

NOTE.—Section A is an *honor section* to which students are admitted only by special permission from the department.

*A	—	8	8	8	8	—	312 U. H.	Blaisdell
C	—	10	10	10	10	—	213 U. H.	Gillet
D	—	11	11	11	11	—	205 L. H.	Koller
E	1	1	1	1	—	—	212 U. H.	Koller
F	2	2	2	2	—	—	312 U. H.	Nordmeyer

6. Scientific Prose.—The rapid reading of works of a general scientific character. (Parallel with 5. Students may not take both 5 and 6 for more than

*Honor section to which students are admitted only by special permission from the department.

a total of four hours' credit without special permission of department.) *II*; (4).

Prerequisite: German 4, or three years of high school German.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	6	4	G	—	8	8	8	8	—	213 U. H.	Uhlendorf
			H	—	9	9	9	9	—	213 U. H.	Fernsemer
			I	—	11	11	11	11	—	— U. H.	Rudwin
			J	1	1	1	1	—	—	310 U. H.	Williams

Third-Year Courses

7. Modern Fiction.—(Intended primarily for students who take 5 in the first semester. Not open to those who have had any course more advanced than 5.) *II*; (3).

Prerequisite: German 5, or equivalent.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	7	3	A	10	—	10	—	10	—	312 U. H.	Blaisdell
			B	11	—	11	—	11	—	212 U. H.	Brooks

10. Introductory Goethe Course.—Reading of works illustrating different periods in Goethe's development: *Götz von Berlichingen*; *Egmont*; *Iphigenie auf Tauris*; selections from *Dichtung und Wahrheit*. *II*; (3).

Prerequisite: German 14, or 16, or 24, or 28a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	10	3	A	10	—	10	—	10	—	212 U. H.	Brooks
			B	11	—	11	—	11	—	311 U. H.	Fernsemer

14. Introductory Schiller Course.—Works illustrating different periods in Schiller's development: Lyrics and Ballads; *Kabale und Liebe*; *Braut von Messina*. *I*; (3).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	14	3	A	10	—	10	—	10	—	212 U. H.	Brooks
			B	11	—	11	—	11	—	205 L. H.	Fernsemer

16. Elementary Composition and Conversation.—*I* or *II*; (2).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	16	2	A	—	9	—	9	—	—	312 U. H.	Blaisdell
			B	—	1	—	1	—	—	213 U. H.	Rudwin
			C	—	2	—	2	—	—	215 L. H.	Brooks

SECOND SEMESTER											
			A	—	11	—	11	—	—	311 U. H.	Fernsemer

17. Intermediate Composition and Conversation.—*I* or *II*; (3).

Prerequisite: German 16.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	17	3	—	10	—	10	—	10	—	205 L. H.	Fernsemer

Germanic Languages and Literature

SECOND SEMESTER

A	9	—	9	—	9	—	311 U. H.	Bloomfield
B	1	—	1	—	1	—	311 U. H.	Rudwin

24. Modern Drama.—Rapid reading of dramas by Grillparzer, Hebbel, Hauptmann, and others. *I*; (3).

Prerequisite: German 5, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	24	3	—	9	—	9	—	9	—	310 U. H.	Koller

28a-28b. German Lyrics.—The form, development, and different types of the lyric. First semester: the chief lyric poets of the classical period. Second semester: the chief lyric poets of the nineteenth century. (The first semester may be taken separately, but not the second without the first.) *I, II*; (2).

Prerequisite: German 5, or equivalent, and sophomore standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	28a	2	—	—	9	—	9	—	—	310 U. H.	Williams

SECOND SEMESTER

German	28b	2	—	Schedule the same as for 28a (first semester).							
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Primarily Fourth-Year Courses

NOTE.—For a major in German students are required to take at least six hours of these primarily fourth-year courses; seniors who are preparing to teach German should take German 29.

8. Schiller.—The life of Schiller; *Wallenstein* and other selections. *II*; (3).

Prerequisite: Three years of college German, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	8	3	—	2	—	2	—	2	—	205 L. H.	Lessing

11. German Literature After the Reformation.—Lectures; recitations; reports on assigned collateral reading. *II*; (3).

Prerequisite: German 26.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	11	3	—	3	—	3	—	3	—	205 L. H.	Lessing

25. Teachers' Course.—Discussion of methods; examination of textbooks. (Open to seniors and special students who have 20 hours' credit in German. This course may not be taken for credit by graduate students.) *II*; (2).

Prerequisite: German 29a or equivalent; completion of or registration in Education 1 or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	25	2	—	—	2	—	2	—	—	212 U. H.	Koller

Germanic Languages and Literature

26. German Literature to the End of the Reformation.—Lectures; recitations; reports on assigned reading. *I*; (3).

Prerequisite: German 10, or 24, or 28a-28b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	26	3	—	3	—	3	—	3	—	205 L. H.	Lessing

27. Lessing.—The Life of Lessing. Study of his plays and dramatic theory. *I*; (3).

Prerequisite: Three years of college German, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	27	3	—	2	—	2	—	2	—	205 L. H.	Lessing

29a-29b. Advanced Composition.—Themes on Germany and German life, based on suitable reading, discussed in German. *I, II*; (3).

Prerequisite: German 17 for 29a; 29a for 29b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	29a	3	—	1	—	1	—	1	—	215 L. H.	Nordmeyer

SECOND SEMESTER				
German	29b	3	—	Schedule the same as for 29a (first semester).

30a-30b. Thesis Course.—(Intended primarily for candidates for honors in German, but open to other seniors.) *I, II*; *(1 or 2).

Prerequisite: Senior standing in College, and three years of college German or equivalent.

FIRST SEMESTER												
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
German	30a	*1 or 2	—					(Arrange)		}	Goebel	
SECOND SEMESTER											Lessing	
German	30b	*1 or 2	—					(Arrange)			Brooks	
											Bloomfield	

31. Middle High German.—*I*; (2).

Prerequisite: Senior or graduate standing; three years of college German.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	31	2	—	—	—	10	—	10	—	215 L. H.	Goebel

Courses for Graduates

Students desiring to take German as a major should have completed a four years' course of undergraduate study in German, corresponding to the four years' course at this University, and should be familiar with the principal works of the writers of the classical and modern periods of German literature, show a general knowledge of the history of German literature, and be able to follow lectures in the German language.

A reading knowledge of Latin and French is required. It is desirable that

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Germanic Languages and Literature

candidates for the degree of Ph.D. have some knowledge of Greek. All students are expected to have had a course in German history.

101. Seminar in Germanic Philology.—Training in original research; results of special value may be published in the *Journal of English and Germanic Philology*. *Once a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	101	1 unit	—	10	—	—	—	—	—	203-A L. H.	Goebel

103. Introduction to the Historical Study of the Germanic Languages.—History of German Philology; comparative grammar of the Old Germanic dialects. Lectures; discussions of special topics. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	103	1 unit	—	—	10	—	10	—	—	215 L. H.	Goebel

104. Gothic.—Grammar and literature. *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	104	1 unit	—	—	10	—	10	—	—	215 L. H.	Goebel

105. Old High German.—Grammar and interpretation of the oldest literary documents. *Three times a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	105	1 unit	—	9	—	9	—	9	—	215 L. H.	Williams

109. Goethe's and Schiller's Philosophy.—*Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	109	1 unit	—	—	—	11	—	11	—	215 L. H.	Goebel

110. Early German Drama.—German drama to the time of the Reformation; medieval religious drama; Shrovetide plays; beginning of the humanistic drama. *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	110	1 unit	—	3	—	3	—	—	—	215 L. H.	Brooks

113. German Literature of the Fifteenth and Sixteenth Centuries.—Survey of the literature on the background of the general history of the time; Luther and the Reformation; Mastersingers and folksongs; the Reformation drama; Hans Sachs; Brant; Fischart; the chap books; the English comedians. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	113	1 unit	—	3	—	3	—	—	—	215 L. H.	Brooks

115. History of German Literature of the Nineteenth Century.—*Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	115	1 unit	—	—	2	—	2	—	—	205 L. H.	Lessing

118. The German Drama Since Schiller.—Research. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	118	1 unit	—	—	3	—	3	—	—	205 L. H.	Lessing

121a. The Nibelungenlied.—Lectures and interpretations. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
German	121a	1 unit	—	—	—	10	—	10	—	205 L. H.	Goebel

B. SCANDINAVIAN

Undergraduates Courses Not Open to Freshmen

1a-1b. Elementary Norwegian.—Grammar; conversation; reading from Björnson, Lie, and Ibsen. *I; (3); II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	1a	3	—	—	—	—	—	—	—	209 L. H.	Flom

SECOND SEMESTER

Scandinavian	1b	2	—	—	—	—	—	—	—	209 L. H.	Flom
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4a-4b. Swedish (Intermediate Course).—Review of parts of the grammar; composition; Strindberg: *Lycko-Pers resa*; lyric poetry; Tegner: *Frithiofs saga*. *I, II; (2).*

Prerequisite: Scandinavian 2a-2b.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	4a	2	—	—	—	—	—	—	—	209 L. H.	Flom

SECOND SEMESTER

Scandinavian	4b	2	—	—	—	—	—	—	—	209 L. H.	Flom
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6. Henrik Ibsen.—Lectures; interpretation of three of the social dramas; Ibsen's technique. Archer's translation is used. *II; (2).*

Prerequisite: Junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	6	2	—	—	9	—	9	—	—	205 L. H.	Flom

12. Norse Mythology.—Primitive religion; the religious belief of the Norseman in pre-Christian times; interpretation of the principal myths. *I; (2).*

Prerequisite: Junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	12	2	—	—	9	—	9	—	—	205 L. H.	Flom

14. History of Old Norse Literature.—Lectures. *II; (2).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Scandinavian	14	2	—	—	—	—	—	—	—	209 L. H.	Flom

History

16. Survey of Early Scandinavian Culture.—Lectures on the civilization of Scandinavia from the Stone Age to 1000 A. D. *I*; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	16	2	—	—	11	—	11	—	—	209 L. H.	Flom

Course for Graduates.

Preparation for graduate work in the Scandinavian languages or literature must include a reading knowledge of one of the Scandinavian languages and systematic work in the undergraduate courses in Scandinavian or their equivalent. Any graduate student in language may, however, be admitted to the purely philological courses. Courses 14 and 16 may be taken for graduate credit.

101. Old Norse.—Introduction to the language as a member of the Germanic group. Reading of the Prose *Edda* with selections from the Icelandic Sagas. *I, II*; (1 unit).

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	101	1 unit	—					(Arrange)		209 L. H.	Flom

GREEK

(See CLASSICS.)

HISTORY

EVARTS BOUTELL GREENE, PH.D., *Professor*
CLARENCE WALWORTH ALVORD, PH.D., *Professor*
LAURENCE MARCELLUS LARSON, PH.D., *Professor*
ALBERT HOWE LYBYER, PH.D., *Professor*
†WILLIAM SPENCE ROBERTSON, PH.D., *Assistant Professor*
PAUL VAN BRUNT JONES, PH.D., *Associate*
THEODORE CALVIN PEASE, PH.D., *Associate*
ARTHUR CHARLES COLE, PH.D., *Associate*
NIELS HENRIKSEN DEBEL, PH.D., *Instructor*
ELIZABETH PARNHAM BRUSH, A.M., *Assistant*
JAY EARLL MILLER, A.M., LL.B., *Assistant*
FRANKLIN CHARLES PALM, A.M., *Assistant*

Coöperating:

WILLIAM ABBOTT OLDFATHER, PH.D., *Professor, Greek*
HOWARD VERNON CANTER, PH.D., *Associate Professor, Latin*

Major: 20 hours, excluding History 1a and 2a, and including (a) either History 1b or 2b; (b) six hours selected from courses for advanced undergraduates and graduates; and (c) any other courses offered in the department.

Minors: 20 hours, including (a) either Economics 1 or Political Science 1 and 3; and (b) one or two of the following subjects: economics, political science, law, sociology, the history of any literature, history of education, philosophy, and physiography. Courses in any foreign language may be accepted in satisfaction of this requirement, if the student can show his ability to read ordinary historical prose in that language.

†On leave of absence.

Courses for Undergraduates

1a-1b. Continental European History.—Europe from the fourth century to the present time. (The work of neither semester may be taken separately without special permission.) *I, II; (4).*

NOTE.—3 credits for seniors.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	1a	4 or 3	Lecture	—	10	—	10	—	—	228 N. H.	Jones
			A	—	—	8	—	8	—	211 U. H.	Palm
			B	—	—	8	—	9	—	311 L. H.	Jones
			C	—	—	8	—	9	—	211 U. H.	Palm
			*D	—	—	10	—	10	—	311 L. H.	Jones
			E	—	—	10	—	10	—	211 U. H.	Brush
			F	—	—	11	—	11	—	311 L. H.	—
			G	—	—	11	—	11	—	211 U. H.	Brush
			H	—	—	1	—	1	—	211 U. H.	Miller
			K	—	—	2	—	2	—	311 L. H.	Jones

SECOND SEMESTER

History 1b 4 — Section D given by Professor Lybyer.
(Sections and schedule otherwise the same as for 1a (first semester).)

2a-2b. English History.—First semester: political history of England to 1603; the larger social, economic, and religious movements. Second semester: the modern history of England; colonial and imperial development. *I, II; (3).*

NOTE.—Two credits for seniors.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	2a	3 or 2	Lecture	—	8	—	8	—	—	418 U. H.	Larson
			A	—	—	—	—	8	—	419 U. H.	Larson
			B	—	—	—	—	8	—	418 U. H.	Miller
			C	—	—	—	—	9	—	418 U. H.	Miller
			D	—	—	—	—	11	—	418 U. H.	Miller
			E	—	—	—	—	1	—	418 U. H.	Larson
			F	—	—	—	1	—	—	418 U. H.	Miller

SECOND SEMESTER

History 2b 3 — Sections and schedule the same as for 2a (first semester).

3a-3b. History of the United States.—First semester: the Colonial era; the Revolution; genesis of the Federal Constitution. Second semester: the United States under the Constitution. (Either semester may be taken separately.) *I, II; (3).*

Prerequisite: One year of college work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	3a	3	Lecture	8	—	—	—	8	—	100 Com	Greene
			A	—	—	8	—	—	—	212 U. H.	Cole
			B	—	8	—	—	—	—	212 U. H.	—
			C	—	—	—	8	—	—	212 U. H.	—
			D	—	—	8	—	—	—	305 L. H.	Greene
			E	—	8	—	—	—	—	305 L. H.	Cole
			F	—	—	—	8	—	—	305 L. H.	Greene

SECOND SEMESTER

History 3b 3 — Sections and schedule the same as for 3a (first semester).

*For sophomores and juniors.

5. History of Greece.—I; (3). (See Greek 20.)

Prerequisite: One college course in history or the classics, sophomore standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	5	3	—	3	—	3	—	3	—	120 L. H.
										Oldfather

6. History of Rome.—II; (3). (See Latin 19.)

Prerequisite: One college course in history or the classics; sophomore standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	6	3	—	8	—	8	—	8	—	120 L. H.
										Canter

17. The History of Illinois.—The political, economic, and social development of a typical commonwealth in the Middle West, considered in its relation to the general course of American history. *II; (2).*

Prerequisite: Junior standing in any college of the University.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	17	2	—	—	11	—	11	—	—	305 L. H.
										Pease

18. The Teaching of History.—Preparation of students for the teaching of history in secondary schools. *I; (2).*

Prerequisite: History 1a-1b, 3a-3b, or their equivalent; senior standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	18	2	—	—	3	—	3	—	—	311 L. H.
										Cole

28a-28b. Thesis.—Special training in investigation for candidates for honors and for other seniors. *I, II; (2).* *Time to be arranged.*

Professor GREENE

Courses for Advanced Undergraduates and Graduates

(Open to seniors and to juniors of high standing. The ability to use French and German is desirable.)

4a-4b. The Constitutional History of England.—First semester: institutional origins. Second semester: modern constitutional practise. (Important for students specializing in history, political science, or law.) *I, II; (3).*

Prerequisite: One year of college history.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	4a	3	—	10	—	10	—	10	—	305 L. H.
										Larson

SECOND SEMESTER										
History	4b	3	—	Schedule the same as for 4a (first semester).						

8. Medieval Civilization.—The religious, economic, and intellectual development of medieval society. *I; (3).*

Prerequisite: History 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	8	3	—	—	10	—	10	—	—	311 L. H.	Larson

9a-9b. The Renaissance and the Reformation.—The transition from medieval to modern ideals. *I, II; (3).*

Prerequisite: History 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	9a	3	—	—	2	—	2	—	—	311 L. H.	Jones

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	9b	3	—	Schedule the same as for 9a (first semester).							

11. Special Topics in Ancient History.—Methods of research in Greek and Roman history. The decline of ancient civilization. *II; (3).*

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	11	3	—	11	—	11	—	11	—	218 L. H.	Oldfather

13. The American Revolution, 1760-1783.—Colonial institutions on the eve of the Revolution; the controversy with the mother country; war and diplomacy; the transition from provincial to republican institutions. *I; (3).*

Prerequisite: History 3a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	13	3	—	3	—	3	—	3	—	305 L. H.	Greene

14b. Constitutional History of the United States Since 1789.—*II; (3).*

Prerequisite: History 3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	14b	3	—	2	—	2	—	2	—	305 L. H.	Cole

15. The Civil War and the Reconstruction in the United States.—*II; (3).*

Prerequisite: History 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	15	3	—	11	—	11	—	11	—	305 L. H.	Cole

16a-16b. The Exploration and Colonization of the West.—First semester: the Mississippi Valley from the earliest European explorations to the close of the war of 1812. Second semester: the Mississippi Valley since 1815, and the progress of western expansion to the Pacific. (Either semester may be taken separately.) *I, II; (2).*

Prerequisite: History 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	16a	2	—	—	10	—	10	—	—	305 L. H.	Alvord

SECOND SEMESTER

History	16b	2	—	Schedule the same as for 16a (first semester).							
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19. France in the Feudal and Later Middle Ages.—A reading knowledge of French is desirable. *II; (3).*

Prerequisite: History 1a-1b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	19	3	—	—	9	—	9	—	—	311 L. H.	Jones

20a. Europe From 1815 to 1871.—I; (3).

Prerequisite: One year of college work in history or political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	20a	3	—	9	—	9	—	9	—	305 L. H.	Lybyer

20b. Europe Since 1871.—II; (3).

Prerequisite: One year of college work in history or political science.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	20b	3	—	9	—	9	—	9	—	305 L. H.	Lybyer

21. The United States Since the Reconstruction.—Historical introduction to contemporary American politics. *I; (3).*

Prerequisite: History 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	21	3	—	2	—	2	—	2	—	305 L. H.	Cole

23. England in the Seventeenth Century with Special Reference to the Puritan Revolution.—The influence of Puritanism on the institutions and ideals of modern England and America. *II; (2).*

Prerequisite: History 1a-1b or 2a-2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	23	2	—	—	11	—	11	—	—	311 L. H.	Pease

29. The Far East.—The contact of Western nations with the Far East from the sixteenth century to the present time. *II; (2).*

Prerequisite: One year of college history, economics, or political science, and senior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	29	2	—	—	8	—	8	—	—	311 L. H.	Greene

30. The Ottoman Empire and the Near East.—The history of the lands around the eastern Mediterranean; their international relations since the great Crusades. *I; (3).*

Prerequisite: One year of college history, economics, or political science, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	30	3	—	11	—	11	—	11	—	305 L. H.	Lybyer

Courses for Graduates

Graduate work in history presupposes two years of college work in this subject, or sixteen semester hours, which should include courses in European and American history corresponding roughly to History 1a-1b and 3a-3b in this University. Linguistic preparation, especially in French and German, is im-

portant. For medieval history some knowledge of Latin is essential, and Spanish is useful for certain fields of American history.

Advanced courses in history at the University of Illinois are of three kinds:

(1) For information and guidance in general reading. (2) Instruction in methodology, historiography, and bibliography. A part of this work (in course 103) is required of all graduate students in history during their first year. (3) Seminar courses for the study of special fields with a view to training in the methods of historical criticism and research.

Illinois Historical Survey.—Students have an opportunity to pursue research in western history in connection with the Illinois Historical Survey, an organization for the purpose of carrying on systematic studies in the history of Illinois.

Attention is also called to the fact that the University of Illinois has for some time co-operated with the Illinois State Historical Society and the Trustees of the State Historical Library, in the gathering and editing of archive material. As a result instructors and graduate students in the department have contributed from time to time to the publications of these state organizations, and have been given useful training in the study of manuscript as well as printed material.

The Historical Club, consisting of graduate students in the department, which meets twice a month, gives an opportunity for informal discussion of historical topics.

101. Seminar in American History.—Bibliography; solution of typical problems; reports on the progress of investigations. *Two hours, once a week; I, II; (1 to 2 units).*

In connection with this course, direction in research is offered as follows:

A. American history before 1789.	Professor GREENE
B. American history since 1789.	Dr. COLE
C. The history of the West.	Professor ALVORD
D. American church history.	Professor GREENE

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	101	1-2 units	—	—	—	—	—	—	9,10	303 L. H.	Greene Alvord Cole

102. Studies in English History.—Selected problems from the history of England in the later middle ages and the early modern period. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	102	1 unit	—							303 L. H.	Larson

(Arrange)

103. Historiography and Historical Method.—Selected problems; studies of representative historians; readings in French and German historical literature. Required of all candidates for an advanced degree in history who do not present evidence of similar training elsewhere. *Twice a week; I, II; (½ unit).*

Horticulture

				BOTH SEMESTERS							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	103	½ unit	—	—	4	—	4	—	—	303 L. H.	Lybber and others

104. Research in European History.—Direction is offered by members of the department as follows:

- | | |
|--|--|
| A. Medieval history. | Professor LARSON |
| B. Modern history of Continental Europe. | Associate Professor LYBYER |
| C. English history. | Professor LARSON |
| D. Renaissance and Reformation. | Dr. JONES |
| E. Asiatic Relations. | Professor GREENE, Associate Professor LYBYER |
- I, II; (1 to 2 units).*

BOTH SEMESTERS												
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
History	104	1-2 units	—							303 L. H.	Lybyer Larson	

105. Studies in the History of the West.—Subject for 1916-17: The French Colonization of the Mississippi Valley. *Once a week; I, II; (1 unit).*

BOTH SEMESTERS											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	105	1 unit	—				(Arrange)			303 L. H.	Alvord

HORTICULTURE

JOSEPH CULLEN BLAIR, M.S., *Professor, Horticulture*

*JOHN WILLIAM LLOYD, M.S., *Professor, Olericulture*

CHARLES SPENCER CRANDALL, M.S., *Professor, Pomology*

CHARLES MULFORD ROBINSON, A.M., *Professor, Civic Design*

HERMAN BERNARD DORNER, M.S., *Assistant Professor, Floriculture*

BETHEL STEWART PICKETT, M.S., *Assistant Professor, Pomology*

RALPH RODNEY ROOT, M.L.A., *Assistant Professor, Landscape Gardening*

ERNEST WINFIELD BAILEY, M.S., *Assistant Professor, Pomology*

CHARLES ELMER DURST, M.S., *Associate, Olericulture*

WARREN A RUTH, A.M., *Associate, Horticultural Chemistry*

SIMEON JAMES BOLE, A.M., *Associate, Pomology*

FRED WEAVER MUNCIE, M.S., PH.D., *Associate, Floricultural Chemistry*

FREDERICK NOBLE EVANS, M.L.A., *Associate, Landscape Design*

ALFRED JOSEPH GUNDERSON, B.S., *Instructor, Pomology*

FRANK LOTAN VENNING, *Instructor, Landscape Design*

WILLIAM SANFORD BROCK, A. B., B.S., *Instructor, Pomology*

ARTHUR SAMUEL COLBY, M.S., *Instructor, Pomology*

DUANE TAYLOR ENGLIS, PH.D., *Instructor, Floriculture Chemistry*

WILLIAM KING PALMER, B.S., *Assistant, Floriculture*

ERNEST MICHAEL RUDOLPH LAMKEY, PH.D., *Assistant, Floricultural Pathology*

HOWARD DEXTER BROWN, B.S., *Assistant, Olericulture*

AUGUST GEORGE HECHT, B.S., *Assistant, Floriculture*

LEON DEMING TILTON, B.S., *Assistant, Landscape Extension*

JAMES HUTCHINSON, *Assistant, Floriculture*

*On leave of absence.

1a. Elements of Horticulture.—Fruit growing, vegetable gardening, and ornamental planting, with special reference to the farm home. Required of all freshmen in the general course in Agriculture. Recitations; practical exercises. *A student is required to register in the same section for both laboratory and quiz. I; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	1a	2	A, Quiz	11	—	11	—	—	—	553 Ag.	Colby
			*Laboratory	—	8,9	—	—	—	—		
			B, Quiz	10	—	10	—	—	—	553 Ag.	Brock
			*Laboratory	—	1,2	—	—	—	—		
			C, Quiz	11	—	11	—	—	—	302 Ag.	Gunderson
			*Laboratory	—	—	—	8,9	—	—		
			D, Quiz	10	—	10	—	—	—	302 Ag.	—
			*Laboratory	—	—	—	—	10,11	—		
			E, Quiz	—	11	—	11	—	—	128 Ag.	Pickett
			*Laboratory	—	8,9	—	—	—	—		
			F, Quiz	—	10	—	10	—	—	302 Ag.	Brock
			*Laboratory	—	1,2	—	—	—	—		
			G, Quiz	—	10	—	10	—	—	Morrow Hall	Gunderson
			*Laboratory	—	—	8,9	—	—	—		
			H, Quiz	—	10	—	10	—	—	702 Ag.	Colby
			*Laboratory	—	—	1,2	—	—	—		
			I, Quiz	—	3	—	3	—	—	128 Ag.	Pickett
			*Laboratory	—	—	—	—	8,9	—		
			J, Quiz	—	3	—	3	—	—	302 Ag.	Bole
			*Laboratory	—	—	—	—	1,2	—		
			K, Quiz	—	3	—	3	—	—	702 Ag.	—
			*Laboratory	—	—	—	—	—	8,9		
			L, Quiz	—	10	—	10	—	—	309 Ag.	Bole
			*Laboratory	—	—	—	—	—	10,11		

1b. Elements of Horticulture.—A continuation of 1a. Required of all freshmen in the General Curriculum in Agriculture. *A student is required to register in the same section for both laboratory and quiz. II; (2).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	1b	2	Sections and schedule the same as for 1a (first semester).								

2. Small Fruits and Grapes.—The grape, strawberry, raspberry, blackberry, dewberry, currant, gooseberry. History; extent of cultivation; soil; location; fertilizers; propagation; planting; tillage; pruning; insect enemies; diseases; varieties; harvesting, marketing. Lectures; reference readings; laboratory. *II; (3).*

Prerequisite: Horticulture 1a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	2	3	Lecture	11	—	11	—	11	—	628 Ag.	Bole
			A, Laboratory	2,3	—	—	—	—	—	—	
			B, Laboratory	—	—	—	1,2	—	—	—	

3. Vegetable Gardening.—The more important factors in commercial vegetable production; survey of trucking sections; analysis of different types of vegetable gardening; factors influencing earliness, fertilizing, insects, and diseases; irrigation; equipment; labor and management problems; marketing; an

*All laboratory sections meet in Vegetable Greenhouse.

Horticulture

exhaustive study of the leading crops. Lectures; reference readings; practical experience in the greenhouse and department gardens. *II*; (5).

Prerequisite: Horticulture 1a and 1b or their equivalent.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	3	5	Lecture	3	—	3	—	3	—	V. G.	Durst
			Laboratory	—	3,4	—	3,4	—	8,9	V. G.	Durst Brown

4. Plant Houses.—Construction, cost, and maintenance; heating; ventilating. *I*; (4).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	4	4	Lecture	3	3	3	3	—	—	F. G.	Dorner
			Quiz	—	—	—	—	3	—	F. G.	Dorner

5. Plant Propagation.—Grafts; buds; layers; cuttings; seeds. Lectures; laboratory; quizzes. *II*; (5).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	5	5	Lecture	—	1	—	1	—	—	F. G.	Dorner
			A, Quiz	1	—	—	—	—	—	F. G.	Hecht
			B, Quiz	2	—	—	—	—	—	F. G.	Dorner
			C, Quiz	3	—	—	—	—	—	F. G.	Hecht
			A, Laboratory	—	—	1,2	—	1,2	—	F. G.	Dorner
			B, Laboratory	—	2,3	—	2,3	—	—	F. G.	Hecht

6. Nursery Methods.—Some details of nursery management and their relation to horticulture in general. Lectures; reference readings. *II*; (2).

Prerequisite: Horticulture 5; Entomology 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	6	2	—	—	1,2	—	1,2	—	—	302 Ag.	Bailey

7. Spraying.—Materials, appliances, and methods employed in combating insects and fungus diseases. Lectures; reference readings; laboratory; field work. *II*; (3).

Prerequisite: Horticulture 1a and 1b or their equivalents; Chemistry 1; Entomology 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	7	3	Lecture	—	—	1	—	—	—	H. B.	Ruth
			Quiz	—	—	2	—	—	—	H. B.	Ruth
			A, Laboratory	10,11	—	—	—	10,11	—	H. B.	Ruth
			B, Laboratory	1,2	—	—	—	1,2	—	H. B.	Ruth

8. Orcharding.—Pomaceous, drupaceous, and nut fruits; management of large commercial orchards; harvesting; grading; packing; storing; marketing. *I*; (5).

Prerequisite: Two years of university work; Horticulture 1a and 1b or their equivalents; Horticulture 5; Botany 1; Entomology 4.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	8	5	—	10	10,11	10	10,11	10	—	309, 303 Ag.	Crandall Bailey

[9. Forestry.—Forest trees; uses; distribution; artificial production; relations of forest and climate; forestry legislation and economy. *II*; (2). Not given, 1916-17.

Prerequisite: Botany 1, or its equivalent.]

10a. Rural Improvement.—Landscape gardening in the open country and its relation to rural conditions, with special reference to the farm group. Lectures; reference readings; reports; occasional field trips. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	10a	2	Lecture	—	11	—	11	—	—	228 N. H.	Root

10b. Town Improvement.—The development of the town as an organism and the improvement of small communities, with special reference to the home grounds. Lectures; reference readings; reports; occasional field trips. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	10b	2	Lecture	—	11	—	11	—	—	Morrow Hall	Evans

11. Study of Cultivated Plants.—The relationship and classification of economic and ornamental plants of the temperate zone; identification of species; examination of living plants and herbarium specimens. Lectures; assigned readings. *I*; (2).

Prerequisite: Botany 4a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	11	2	—	—	2	—	2	—	—	703 Ag.	Blair Crandall

12. Evolution of Horticultural Plants.—History, botanical classification, and geographical distribution of cultivated plants; modification under culture; theoretical causes and observed factors that influence variation, particularly food supply, climate, and cross-fertilization. *I*; (3).

Prerequisite: Two years of university work; Horticulture 8 and Botany 4a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	12	3	—	11	—	11	—	11	—	309 Ag.	Crandall

15a. Principles of Plant Growing.—Preparation of soils for greenhouse crops; fertilizers; potting and shifting plants; watering. Lectures; practical greenhouse work. *II*; (5).

Prerequisite: Horticulture 5; Botany 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	15a	5	Lecture	—	10	—	10	—	—	F. G.	Dorner
			Laboratory	10,11	—	10,11	—	10,11	—	F. G.	Dorner Hecht

15b. Commercial Crops.—Greenhouse plants and cut flowers for wholesale and retail markets; care and marketing of the crops. Lectures; greenhouse work. *I*; (5).

Prerequisite: Horticulture 15a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	15b	5	Lecture	—	2	—	2	—	—	F. G.	Palmer
			Laboratory	1,2	—	1,2	—	1,2	—	F. G.	Palmer

17. Commercial Fruit Culture.—Practical work in orchards and green-houses; reference readings; seminar. A limited number of trips will be taken, cost not to exceed \$10.00. For students specializing in pomology. *I*; (5).

Prerequisite: Horticulture 8 or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	17	5	—	1,2	1,2	1,2	1,2	1,2	—	V. G.	Bailey

18. Experimental Horticulture.—Methods and difficulties in horticultural investigations; the planning of experiments; recording and interpretation of results. For advanced students preparing for experiment station work. *II*; (5).

Prerequisite: Twenty hours' work in horticulture.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	18	5	—	10	10	10	10	10	—	302 Ag.	Blair Pickett

19. Amateur Floriculture.—Window gardening; growing of flowers upon the home grounds; containers; potting soils; fertilizers; preparation and planting of flower beds; propagation and culture of plants for window and garden. *I*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	19	3	—	9	—	9	—	9	—	F. G.	Hecht

21a. Landscape Design (Elementary Course).—Simple composition as applied to landscape design; types of drafting and presentation used in office practise. *I*; (4).

Prerequisite: Architecture 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	21a	4	Lecture	2	—	—	—	—	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Tilton

21b. Landscape Design (Second Course).—Private estates and gardens in city and suburban developments. *II*; (4).

Prerequisite: Horticulture 21a.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	21b	4	Lecture	2	—	—	—	—	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Tilton

22. Special Investigation and Thesis.—*I* or *II*; *(5-10).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	22	*5 to 10	—				(Arrange)			—	—

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

23a-23b. Landscape Design (Third Course).—Drafting; field trips; assigned readings; reports; occasional lectures. *I, II; (4).*

Prerequisite: Horticulture 21b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	23a	4	Lecture	—	—	2	—	—	—	302 Ag.	Root
			Laboratory			(Arrange)				307 Ag.	Root
SECOND SEMESTER											
Horticulture	23b	4	Lecture	—	—	—	—	10	—	302 Ag.	Root
			Laboratory			(Arrange)				307 Ag.	Root Venning

24a.—Trees and Shrubs.—Lectures; reference readings; field trips. *II; (3).*

Prerequisite: Botany 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	24a	3	Lecture	3	—	3	—	3	—	302 Ag.	Root
			Laboratory			(Arrange)				—	—

24b. Trees and Shrubs.—(Continuation of 24a.) Lectures; reference readings; field trips. *I; (3).*

Prerequisite: Horticulture 24a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	24b	3	Lecture	3	—	3	—	3	—	302 Ag.	Root
			Laboratory			(Arrange)				—	—

25a-25b. Advanced Landscape Design.—Drafting; field trips; assigned readings; reports; occasional lectures; 15 hours' drafting per week. *I, II; (5).*

Prerequisite: Horticulture 23b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	25a	5	Lecture	—	—	—	—	2	—	306 Ag.	Evans
			Laboratory				(Arrange)				307 Ag.

26a. Planting Design (First Course).—The planting of private estates and gardens. Problems based on those worked out in Courses 21b and 23b. Planting; lectures; drafting; reference readings; field trips; planting specifications; reports. Six hours' drafting; one lecture. *II; (3).*

Prerequisite: Horticulture 23a, 24b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	26a	3	Lecture	—	—	—	—	11	—	302 Ag.	Root
			Laboratory			(Arrange)				307 Ag.	Root

26b. Planting Design (Second Course).—The planting of public properties, parks, city forestry work, golf courses, cemeteries. Problems based on those worked out in Courses 23b and 25. Lectures; drafting; conferences. Six hours' drafting; one lecture. *I; (3).*

Prerequisite: Horticulture 26a.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	26b	3	Lecture	—	—	—	—	11	—	302 Ag.	Evans
			Laboratory				(Arrange)				307 Ag.

Horticulture

27a-27b. Landscape Practise.—Principles of construction. The preparation of construction drawings such as grading plans, working drawings, specifications, and reports. *I, II; (3).*

Prerequisite: Civil Engineering 32.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	27a	3	Lecture	—	—	—	10	—	—	302 Ag.	Tilton
			Laboratory				(Arrange)			307 Ag.	Tilton
SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	27b	3	Lecture	10	—	10	—	—	—	302 Ag.	Tilton
			Laboratory				(Arrange)			307 Ag.	Tilton

28. Exotics.—Temporary decorative plants used in landscape gardening. Lectures; planting plans; field trips. *II; (1).*

Prerequisite: Horticulture 23b, 24b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	28	1	Lecture	—	3	—	—	—	—	306 Ag.	Evans
			Laboratory				(Arrange)			307 Ag.	Evans

29a. Garden Design.—The garden in its relation to the house; architectural harmony, utilization, topographic conditions, and planting for architectural or horticultural emphasis. Eight hours' drafting; one lecture. *I; (3).*

Prerequisite: Architecture 32.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	29a	3	Lecture	—	—	—	—	11	—	302 Ag.	Root
			Laboratory				(Arrange)			307 Ag.	Root Venning

29b. Garden Design.—The designing of period gardens and their relation to garden design. Eight hours' drafting; one lecture. *II; (3).*

Prerequisite: Horticulture 23a or Architecture 33.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	29b	3	Lecture	—	—	9	—	—	—	302 Ag.	Venning
			Laboratory				(Arrange)			307 Ag.	Venning

30. Decorative and Bedding Plants.—Tropical and sub-tropical plants used in decorative work in the conservatory; tender plants used in out-door bedding. Lectures; practical greenhouse work. *II; (5).*

Prerequisite: Horticulture 15a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	30	5	Lecture	—	9	—	9	—	—	F. G.	Hecht
			Laboratory	8,9	—	8,9	—	8,9	—	F. G.	Hecht

31. Garden Flowers.—The propagation and growing of annuals, herbaceous perennials, bulbs, and shrubs for cut flowers and ornamental plantings. *I; (3).*

Prerequisite: Horticulture 5; Botany 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	31	3	Lecture	10	—	10	—	10	—	F. G.	Dorner
			Laboratory				(Arrange)			F. G.	Dorner

32. Floral Decoration.—Cut flowers and plants in decorative work; arrangement of flowers in baskets, designs, and bouquets; table decoration; house decoration. (For floricultural students.) *II*; (4).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	32	4	Lecture	3	—	3	—	3	—	F. G.	Dorner
			Laboratory	—	—	—	—	—	8-12	F. G.	Dorner

33. Systematic Pomology.—Description, nomenclature, and classification of native and sub-tropical fruits; critical descriptions and identification with special reference to relationships and classifications of varieties. Training is given in judging and displaying fruits. *I*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	33	2	—	—	10,11	—	10,11	—	—	204 Ag.	Bailey

34. Vegetables Under Glass.—Practical training in the forcing of vegetables. Lectures; reference readings; laboratory. *I*; (3).

Prerequisite: Horticulture 3, 15a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	34	3	—	1,2	—	1,2	—	1,2	—	V. G.	Durst Brown

35. Private Conservatory Work.—Types of plants for large conservatories; arrangement; care. *II*; (3).

Prerequisite: Horticulture 15a, 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	35	3	—				(Arrange)			F. G.	Dorner

36. History of Landscape Gardening.—Lectures; reference readings; library sketches; reports. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	36	2	—	—	11	—	11	—	—	309 Ag.	Root

37a. Civic Design.—Town remodeling; remedial problems in town planning. Lectures; field trips; reference readings; reports; drafting. *I*; (3).

Prerequisite: Horticulture 41 or Political Science 4 or 34.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	37a	3	Lecture				(Arrange)			306-B Ag.	Robinson, Evans
			Laboratory				(Arrange)			—	Robinson, Evans

Horticulture

37b. Civic Design.—Town extension; preventive and preservative aspects of town planning. Lectures; reference readings; drafting; textbook. *II*; (3).

Prerequisite: Horticulture 37a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	37b	3	Lecture					(Arrange)		306-B Ag.	Robinson
			Laboratory					(Arrange)			Robinson

38. Office Practise in Landscape Gardening.—Lectures; office work; reports. Actual practise in carrying out landscape plans in the field. *I* or *II*; (2).

Prerequisite: Horticulture 27b, 23b.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	38	2	Lecture	9	—	—	—	9	—	303 Ag.	Root
			Laboratory							—	Root
								(Arrange)			Robinson
											Evans

39a-39b. Special Lectures.—Lectures by members of the faculty and invited lecturers, on the working out of problems in landscape gardening. Certain inspection trips will be required of the class. The expense of these trips will be about \$2.00. One lecture a week with written reports. *I, II*; (1).

Prerequisite: Permission of the instructor in charge.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	39a	1	—	—	—	—	3	—	—	309 Ag.	Root

SECOND SEMESTER											
Horticulture	39b	1	—	—	—	—	2	—	—	309 Ag.	Root

40a. Trees and Shrubs (Advanced Course).—Laboratory; field and herbarium work; assigned readings; seminar conferences. *I*; (3).

Prerequisite: Horticulture 24b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	40a	3	Lecture	—	1	—	1	—	—	306 Ag.	Root
			Laboratory					(Arrange)		306 Ag.	—

40b. Trees and Shrubs (Advanced Course).—Special problems in the classification and arrangement of plants as to their leaf color. *II*; (3).

Prerequisite: Horticulture 24b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	40b	3	Lecture	—	1	—	1	—	—	306 Ag.	Venning
			Laboratory					(Arrange)		306 Ag.	Venning

41. Civic Design (Elementary Course).—Lectures introductory to city planning; reference readings; reports. *II*; (1).

Prerequisite: Horticulture 23a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	41	1	—	8	—	—	—	—	—	702 Ag.	Robinson Evans

42. Landscape Design (Elementary Course).—The principles and application of landscape design to private grounds in the country and city. Lectures; reference readings; reports; six hours' drafting per week. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	42	8	Lecture	—	—	—	1	—	—	209 Ag.	—
			Laboratory				(Arrange)			209 Ag.	—

Courses for Advanced Undergraduates and Graduates.

43. Nutrition of Greenhouse Crops.—Soils and fertilizers; moisture and carbon dioxide content of the air; temperature as related to greenhouse crops; greenhouse practise in application of fertilizers, in watering, and in temperature and humidity regulation. Lectures; seminar; laboratory. *I*; (5).

Prerequisite: Botany 3b; Agronomy 9; Horticulture 3 or 15a.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	43	5	Lecture	—	—	11	—	11	—	F. G.	Muncie
			Quiz	11	—	—	—	—	—	F. G.	Muncie
			Laboratory	—	10,11	—	10,11	—	—	F. G.	Muncie, Englis

44. Pomology Seminar.—Assigned topics; review of books, current technical journals, and other publications. For seniors and graduates specializing in pomology. *I, II*; (1).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	44	1	—				(Arrange)			412 U. H.	Pickett

Courses for Graduates

At least two years of collegiate work in horticulture and allied subjects and specific preparation for the chosen topics are required for entrance upon major work in this department.

103. Olericulture.—Horticultural relationships, origins, breeding, fertilizing, cultural requirements, and improvement of vegetables. Conferences. *I, II*; (*1 to 2 units; a student working part time and extending his study for the master's degree over two years may register ½ to 1 unit for each of the four semesters*). *Time to be arranged.* Professor BLAIR, Professor LLOYD

108. Pomology.—Special problems in the relationship, adaptation, improvement, propagation, cultivation, pruning, protection, preservation, or marketing of small fruits and orchard fruits. Conferences. *I, II*; (*1 to 2 units; a student working part time and extending his study for the master's degree over two years may register for ½ to 1 unit for each of the four semesters*). *Time to be arranged.* Professor BLAIR, Professor CRANDALL

115. Floriculture.—The horticultural status of flowering plants, or special problems in the culture of greenhouse plants. *I, II*; (*1 to 2 units*). *Time to be arranged.* Assistant Professor DORNER, Dr. MUNCIE

116. Chemistry of Plant Nutrition.—The occurrence of organic compounds in plants; their significance in plant nutrition. Methods of analysis and investigation. Lectures; seminar; laboratory. *I, II*; (*¾ to 1¼ units*). *Time to be arranged.* Dr. MUNCIE

HOUSEHOLD SCIENCE

ISABEL BEVIER, PH.D., *Professor and Director*RUTH WHEELER, PH.D., *Assistant Professor*LURENE SEYMOUR, PH.B., B.S., *Associate*CORA EMELINE GRAY, M.S., *Associate*MAUD EDNA PARSONS, A.B., *Associate*FLORENCE HARRISON, B.S., *Associate*LORINDA PERRY, PH.D., *Associate*LUCILE WHEELER, A.M., *Associate*GEORGIA ELIZABETH FLEMING, B.S., *Instructor*ANNA WALLER WILLIAMS, A.M., *Instructor*LEONA HOPE, *Instructor*MARY C DEGARMO, A.M., *Instructor*JEAN GILBERT MACKINNON, A.M., *Instructor*MARIE E FREEMAN, A.B., *Assistant*MADGE LAMOREAUX, B.S., *Assistant*

Major: 20 hours from any courses offered by the department, excluding Household Science 2 and 7, and including Household Science 5, 6, 12, and 3.

Minors: 20 hours from either (a) chemistry, bacteriology, and physiology; or (b) economics (a minimum of eight hours), with one or two of the following subjects: art and design, education, history, psychology, and sociology.

Food

1. Selection and Preparation of Food.—The nature and uses of foods, their chemical composition, and the changes effected by heat, cold, or fermentation; principles of selection, illustrated by marketing expeditions; processes of manufacture; combinations of different kinds. *II*; (3).

Prerequisite: Entrance credit in physics; Chemistry 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	1	3	Lecture	—	—	—	11	—	—	113 W. B.	L. Wheeler MacKinnon DeGarmo
			A ₁ , Laboratory	10,11	—	10,11	—	—	—	235 W. B.	
			A ₂ , Laboratory	10,11	—	10,11	—	—	—	Basement	
			B ₁ , Laboratory	2,3	—	2,3	—	—	—	235 W. B.	
			B ₂ , Laboratory	2,3	—	2,3	—	—	—	Basement	
			B ₃ , Laboratory	2,3	—	2,3	—	—	—	227 W. B.	
			C ₁ , Laboratory	—	5,9	—	8,9	—	—	235 W. B.	
			C ₂ , Laboratory	—	8,9	—	8,9	—	—	Basement	
			D ₁ , Laboratory	—	2,3	—	2,3	—	—	235 W. B.	
			D ₂ , Laboratory	—	2,3	—	2,3	—	—	Basement	
			A, Quiz	—	—	—	—	8	—	121 W. B.	
			B ₁ , Quiz	—	—	—	—	10	—	117 W. B.	
			B ₂ , Quiz	—	—	—	—	10	—	121 W. B.	
			C ₁ , Quiz	—	—	—	—	2	—	113 W. B.	
			C ₂ , Quiz	—	—	—	—	2	—	117 W. B.	
			D, Quiz	—	—	—	—	3	—	117 W. B.	

6. Economic Uses of Food.—(Continuation of 1.) The economics of the food question; uses and applications of preservatives. *I*; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	6	3	Lecture	—	—	—	11	—	—	113 W. B.	L. Wheeler MacKinnon DeGarmo
			A ₁ , Laboratory	10,11	—	10,11	—	—	—	235 W. B.	
			A ₂ , Laboratory	10,11	—	10,11	—	—	—	Basement	
			B ₁ , Laboratory	2,3	—	2,3	—	—	—	235 W. B.	
			B ₂ , Laboratory	2,3	—	2,3	—	—	—	Basement	
			C ₁ , Laboratory	—	8,9	—	8,9	—	—	235 W. B.	
			C ₂ , Laboratory	—	8,9	—	8,9	—	—	Basement	
			D, Laboratory	—	2,3	—	2,3	—	—	235 W. B.	
			A ₁ , Quiz	—	—	—	—	8	—	327 W. B.	
			A ₂ , Quiz	—	—	—	—	8	—	121 W. B.	
			B ₁ , Quiz	—	—	—	—	10	—	117 W. B.	
			B ₂ , Quiz	—	—	—	—	10	—	121 W. B.	
			C ₁ , Quiz	—	—	—	—	2	—	117 W. B.	
			C ₂ , Quiz	—	—	—	—	2	—	113 W. B.	
			D, Quiz	—	—	—	—	3	—	121 W. B.	

14. Problems in the Preparation and Service of Food.—(Continuation of courses 1 and 6.) Preparation and service of meals for a family; cost and dietetic values; the preparation of food in quantities; individual problems in the manipulation of food materials. *I or II*; (3).

Open to: (a) those who are preparing for lunch-room management; (b) those who are preparing for extension work; (c) in special cases, those who have completed the major in household science.

Prerequisite: Household Science 1, 6; Chemistry 1, 2a; junior standing, and the consent of the instructor.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	14	3	A, Laboratory	8,9	—	8,9	—	8,9	—	235 W. B.	Gray
			B, Laboratory	8,9	—	8,9	—	8,9	—	227 W. B.	Williams

5. Dietetics.—Diet; the relation of food to health; influence of age, sex, and occupation on diet; the construction of dietaries; dietetic treatment of certain diseases. Laboratory. *I or II*; (3).

Prerequisite: Household Science 1, 6; Physiology 4; Chemistry 1, 2a.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	5	3	Lecture	—	—	—	10	—	—	113 W. B.	DeGarmo
			A, Laboratory	10,11	—	—	—	—	—	229 W. B.	
			B, Laboratory	—	—	10,11	—	—	—	229 W. B.	
			C, Laboratory	—	—	—	—	10,11	—	229 W. B.	
			A, Quiz	—	10	—	—	—	—	113 W. B.	
			B, Quiz	—	11	—	—	—	—	113 W. B.	

18. Lunch-Room Management.—Organization and equipment of lunch rooms. Laboratory practise. The class takes a trip to Chicago to inspect various types of lunch rooms. The cost of the trip is about \$15.00. *I or II*; (5).

Prerequisite: Household Science 5, 14; Economics 1 or 2; senior standing.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household	18	5	Lecture	—	—	1	—	—	—	117 W. B.	Parsons
			Quiz	(Arrange)							
			Laboratory, two consecutive 3-hr. periods (arrange).								

4. Food and Nutrition.—The physiological, chemical, and bacteriological problems of food and nutrition. Individual investigation. *I*; (5).

Prerequisite: Bacteriology 5; Chemistry 1, 2a, 13a, 9, 9c; Household Science 5.

Household Science

Subject	No.	Credits	Section	FIRST SEMESTER					S	Room	Instructor
				M	T	W	T	F			
Household Science	4	5	Lecture	8	—	—	—	—	—	117 W. B.	R. Wheeler
			A, Discussion	—	—	—	—	8	—	117 W. B.	R. Wheeler
			A, Laboratory	—	8,9	8,9	8,9	—	—	215 W. B.	R. Wheeler
			B, Discussion	—	—	—	—	11	—	117 W. B.	R. Wheeler
			B, Laboratory	—	10,11	10,11	10,11	—	—	215 W. B.	R. Wheeler

20. Infant Nutrition.—Lectures; readings; discussions. *I*; (2).

Prerequisite: Household Science 5; senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER					S	Room	Instructor
				M	T	W	T	F			
Household Science	20	2	—	—	2	—	2	—	—	117 W. B. 221 E. H.	R. Wheeler

The House

2. Home, Architecture and Sanitation.—Situation, surroundings, and construction of the house; hygiene, heating, lighting, ventilation, water supply, and drainage. House planning and sanitary plumbing, fixtures, and internal drainage; making skeleton plans. *I*; (2).

Subject	No.	Credits	Section	FIRST SEMESTER					S	Room	Instructor
				M	T	W	T	F			
Household Science	2	2	Lecture	—	9	—	—	9	—	113 W. B.	<div style="display: inline-block; vertical-align: middle;"> <div style="display: inline-block; vertical-align: middle; font-size: 3em; line-height: 1;">}</div> <div style="display: inline-block; vertical-align: middle; padding-left: 5px;"> Bevier Fleming Williams Hope Clark Ash </div> </div>
			A, Quiz	—	—	8	—	—	—	121 W. B.	
			B, Quiz	—	—	8	—	—	—	117 W. B.	
			C, Quiz	—	—	9	—	—	—	121 W. B.	
			D, Quiz	—	—	9	—	—	—	117 W. B.	
			E, Quiz	—	—	9	—	—	—	113 W. B.	
			F, Quiz	—	—	3	—	—	—	121 W. B.	
			G, Quiz	—	—	3	—	—	—	117 W. B.	

3. Elementary Home Decoration.—Evolution of the house and home; homes of primitive peoples; theory of color and its application in home decoration; furnishings from a sanitary and artistic standpoint. *II*; (2).

Prerequisite: Art and Design 12; Household Science 2; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER					S	Room	Instructor
				M	T	W	T	F			
Household Science	3	2	—	—	9	—	9	—	—	113 W. B.	Bevier Hope

10. Household Equipment and Management.—Expenditure of the income; organization of the household; care of the house and family; home nursing; the domestic service problem. Laboratory work in practise apartment. *II*; (2).

Prerequisite: Household Science 1, 2, 6; Economics 1 or 2; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER					S	Room	Instructor
				M	T	W	T	F			
Household Science	10	2	—	—	11	—	11	—	—	121 W. B.	Gray Williams

Textiles and Clothing

7. Textiles.—Development of the textile industry from primitive times to the present; the important fibers and materials made from them; movements for bettering textile conditions. *I* or *II*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	7	2	Lecture	—	10	—	—	—	—	113 W. B.	Seymour
			A, Quiz	3	—	—	—	—	—	117 W. B.	Seymour
			B, Quiz	—	—	3	—	—	—	117 W. B.	Seymour
			C, Quiz	—	—	—	10	—	—	117 W. B.	Seymour
			D, Quiz	—	—	—	3	—	—	117 W. B.	Seymour

SECOND SEMESTER											
			Lecture	—	1	—	—	—	—	113 W. B.	Seymour
			A, Quiz	—	—	—	11	—	—	117 W. B.	Seymour
			B, Quiz	—	—	—	1	—	—	117 W. B.	Seymour
			C, Quiz	—	—	—	2	—	—	117 W. B.	Seymour

21. Weaving.—Application of the principles of design to weaving. Lectures; laboratory. *I*; (1).

Prerequisite: Art and Design 1, 12; Household Science 7.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	21	1	—	—	—	—	8,9,10	—	—	219 W. B.	Seymour

19. Dress Design.—Study of dress from artistic, historic, economic, and hygienic standpoints. Application of principles of design to silhouette, proportion, line, and color. *I*; (3).

Prerequisite: Art and Design 1, 12; Household Science 7.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	19	3	Lecture	—	—	—	—	8	—	113 W. B.	Hope
			A, Laboratory	8,9	—	8,9	—	—	—	309 W. B.	Hope
			B, Laboratory	1,2	—	1,2	—	—	—	309 W. B.	Hope
			C, Laboratory	—	10,11	—	10,11	—	—	309 W. B.	Hope
			D, Laboratory	—	1,2	—	1,2	—	—	309 W. B.	Hope

12. Clothing (Continuation of 19).—Demonstrations and laboratory work in drafting, cutting, fitting, and making of garments from designs prepared in Household Science 19. *II*; (3).

Prerequisite: Household Science 19.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	12	3	A, Laboratory	8,9	—	8,9	—	8,9	—	203 W. B.	Fleming Lamoreaux
			B, Laboratory	10,11	—	10,11	—	10,11	—	203 W. B.	
			C, Laboratory	1,2	—	1,2	—	1,2	—	203 W. B.	
			D, Laboratory	1,2	—	1,2	—	1,2	—	203 W. B.	
			E, Laboratory	—	10,11	—	10,11	—	10,11	203 W. B.	

17. Problems in the Study of Textiles.—Microscopic and chemical analysis of fabrics; dyeing; special problems. *II*; (3).

Prerequisite: Household Science 7, 12; Chemistry 1, 2a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	17	3	Lecture	—	—	—	—	2	—	219 W. B.	Seymour
			Laboratory	2,3	—	2,3	—	—	—	215 W. B.	Seymour

Courses for Teachers

11. *Teachers' Course.—The best methods of presenting the work, and its correlation with other subjects. Practise in planning and presenting of courses. Two inspection trips are made to other schools, one in April and one in May. The total cost does not exceed \$5.00. *II*; (3).

Prerequisite: Household Science 3, 5, 12, and 13; laboratory work in sewing, Saturday morning, first semester; senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Household Science	11	3	—	—	10	—	10	—	—	121 W. B. } Bevier Harrison Seymour

13. History of Home Economics.—The development of home economics as one of the factors in the education of women; the work in different types of institutions; the planning of courses for these types. *I*; (2).

Prerequisite: Senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Household Science	13	2	—	—	—	3	—	3	—	113 W. B. } Bevier Harrison Seymour

9. Individual Problems.—Different phases of home economics. *II*; (3).

Prerequisite: Senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Household Science	9	3	—	2	—	2	—	2	—	119 W. B. } Bevier

Economics of the Family

15. Economics of the Family Group.—The economic relations of the family as a whole and as individuals. Retail market; sources of income, and social and industrial conditions affecting them; child labor; economic position of women. *I*; (3).

Prerequisite: Household Science 3, 5, 10, 12.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
Household Science	15	3	—	2	—	2	—	2	—	121 W. B. } Perry

Courses for Graduates

This department is prepared to offer graduate work along two lines; one dealing with the applications of the biological and physical sciences to the problems of food and nutrition; the other with the economic phases of the problems of the household. In either case the student should offer the equivalent of a major in Household Science in the University of Illinois. At present this major includes a minimum of nine hours' work with food, seven with textiles and clothing, and four with the house, with the addition of four elective hours which

*Millinery for those taking Household Science 11 is given from 10 to 12 o'clock on Saturday the second semester, and sewing from 2 to 4 o'clock Tuesday or 10 to 12 o'clock Saturday the first semester.

may be taken from any of the above groups. The student must also offer two years of chemistry, including general, organic, and quantitative, together with a year of biological science and a year of economics or sociology.

101. Home Economics.—Origin and development of home economics; its industrial, educational and sociological aspects. *Twice a week; I; (1 unit).*
Time to be arranged. Professor BEVIER

102. Special Investigations.—Problems in the application of the principles of bacteriology, chemistry, and physiology to the ordinary processes used in the preparation of food; problems in nutrition. *Twice a week; I, II; (1 unit).*
Time to be arranged. Professor BEVIER, Assistant Professor WHEELER

103. Seminar.—Recent advances in nutrition. *Once a week; II; (½ unit).*
Time to be arranged. Assistant Professor WHEELER

104. Economic Problems of the Family Group.—An intensive study of the economic phases of selected problems of the household. *Twice a week; I, II; (1 unit).* *Time to be arranged.* Dr. PERRY

HUMAN ANATOMY

(See under ZOOLOGY.)

ITALIAN

(See ROMANCE LANGUAGES AND LITERATURE.)

JOURNALISM

(See RHETORIC, under THE ENGLISH LANGUAGE AND LITERATURE.)

LANDSCAPE GARDENING

(See HORTICULTURE.)

LATIN

(See CLASSICS.)

LAW

OLIVER ALBERT HARKER, A.M., LL.D., *Professor*

*FREDERICK GREEN, A.M., LL.B., *Professor*

EDWARD HARRIS DECKER, A.B., LL.B., *Professor*

JOHN NORTON POMEROY, A.M., LL.B., *Professor*

WILLIAM GREEN HALE, B.S., LL.B., *Professor, Secretary*

CHARLES ERNEST CARPENTER, A.M., LL.B., *Assistant Professor*

First Year Courses

NOTE.—In addition to the regular courses, first year students are required to attend one quiz-hour each week.

1a-1b. Contracts.—Williston's *Cases on Contracts*, Vols. I and II. Selected Illinois Cases. *I; (4) : II; (3).*

*On leave of absence.

Law

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	1a	4	—	(See special Law program)						202†	Decker

SECOND SEMESTER

Law	1b	3	—	(See special Law program)						202	Decker
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2a-2b. Torts.—Ames and Smith's *Cases on Torts*. I, II; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	2a	3	—	(See special Law program)						202	Hale

SECOND SEMESTER

Law	2b	3	—	(See special Law program)						202	Hale
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37. Introduction to the Study of Law.—I; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	37	1	—	(See special Law program)						202	Decker

3. Real Property.—(Case book to be announced later.) II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	3	3	—	(See special Law program)						202	Carpenter

[4. Common Law Pleading.—II; (3). Not given in 1916-17.]

5. Criminal Law.—Beale's *Cases on Criminal Law*, (2nd edition). I; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	5	4	—	(See special Law program)						202	—

6. Personal Property.—Gray's *Cases on Property*, Vol. I, (2nd edition). I; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	6	2	—	(See special Law program)						202	—

7. Domestic Relations.—Woodruff's *Cases on Domestic Relations*, (2nd edition). II; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	7	2	—	(See special Law program)						202	—

11. Agency.—Wambaugh's *Cases on Agency*. II; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Law	11	3	—	(See special Law program)						202	Carpenter

(For second-year and third-year courses, see the special College of Law program, September, 1916.)

†All courses are given in the Law building.

LIBRARY SCIENCE

PHINEAS LAWRENCE WINDSOR, PH.B., *Director*

FRANCES SIMPSON, M.L., B.L.S., *Assistant Director, Assistant Professor*

ERNEST JAMES REECE, PH.B., *Associate*

ETHEL BOND, A.B., B.L.S., *Instructor*

EMMA FELSENTHAL, PH.B., B.L.S., *Instructor*

SABRA W VOUGHT, A.B., B.L.S., *Instructor*

EDNA LYMAN SCOTT, *Special Lecturer*

FRANCIS KEESE WYNKOOP DRURY, A.M., B.L.S., *Lecturer, Order Work*

ALICE SARAH JOHNSON, A.B., B.L.S., *Lecturer, General Reference*

MARGARET HUTCHINS, A.B., B.L.S., *Lecturer, General Reference*

2a-2b. Reference Work.—Methods of bibliographical research; the use of reference books; practical work in the reference department of the University library. *I, II; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 2a	3		A	9	—	9	—	9	—	305 Lib.	Simpson
			B	11	—	11	—	11	—	305 Lib.	Simpson

SECOND SEMESTER										
Library Science 2b	3	—	Sections and schedule the same as for 2a (first semester).							

3a-3b. Selection of Books.—Principles of selection for libraries of different types; standard lists, critical periodicals, and other aids; practise in writing book annotations. *I, II; (2).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Library Science 3a	2	—	—	—	8	—	8	—	—	305 Lib.
										<i>Instructor</i>
										Felsenthal

SECOND SEMESTER										
Library Science 3b	2	—	Schedule the same as for 3a (first semester).							

4a-4b. Practise Work.—Work in the various departments of the University library. To be taken with Library 2, 16, 17, 18, 19, 20, and 21. *I, II; (2).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Library Science 4a	2	—	—	—	—	—	(Arrange)	—	—	—
										<i>Instructor</i>
										Reece

SECOND SEMESTER										
Library Science 4b	2	—	—	—	—	—	(Arrange)	—	—	—
										<i>Instructor</i>
										Reese

6a-6b. Subject Bibliography.—Selection of books in special subjects; the literature and bibliography of each. Lectures by professors in the respective departments of the University. *I, II; (2).*

FIRST SEMESTER										
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>
Library Science 6a	2	—	—	—	11	—	11	—	—	309 Lib.
										<i>Instructor</i>
										Windsor and others

SECOND SEMESTER										
Library Science 6b	2	—	—	—	—	—	—	—	—	—
										<i>Instructor</i>
										Schedule the same as for 6a (first semester).

Library Science

7. History of Libraries.—The foundation, development, and resources of the leading libraries of Europe and the United States. Given in alternate years. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 7	7	2	—	—	9	—	9	—	—	305 Lib.	Simpson

8. Advanced Reference.—Transactions of learned societies; special periodicals and government publications; indexes and other works of value to a large reference department. *I*; (2).

Prerequisite: Library 2a-2b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 8	8	2	—	—	9	—	9	—	—	309 Lib.	Simpson

[9. History of Books and Printing.—History of the early forms of books; the invention and spread of printing; book illustration; book-binding. *II*; (2). Given in alternate years. Not given in 1916-17.]

10a-10b. Practise Work.—A continuation of Library 4a-4b, supplemented by one month of work as a member of the staff of an assigned public library. *I, II*; (4).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 10a	4	—	—	—	—	—	—	—	—	—	Reece

SECOND SEMESTER

Library Science 10b	4	—	—	—	—	—	—	—	—	—	Reece
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12. General Reference.—Classification and arrangement of books in the University library; the card catalogs; the more generally used reference books. (Intended for freshmen and sophomores in the University, not for students in Library School.) Repeated each semester. *I* or *II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 12	2	—	A	3	—	—	—	—	—	305 Lib.	Vought
			B	—	9	—	—	—	—	305 Lib.	Hutchins
			C	—	3	—	—	—	—	305 Lib.	Johnson
			D	—	—	—	11	—	—	305 Lib.	—
			E	—	—	—	—	2	—	305 Lib.	Felsenthal

SECOND SEMESTER

A	3	—	—	—	—	—	—	—	—	305 Lib.	Vought
B	8	—	—	—	—	—	—	—	—	305 Lib.	—
C	—	3	—	—	—	—	—	—	—	305 Lib.	Johnson
D	—	—	—	—	—	—	11	—	—	305 Lib.	Hutchins
E	—	—	—	—	—	—	—	2	—	305 Lib.	Felsenthal

13a-13b. Public Documents.—First semester: production and distribution of United States documents; their treatment and use as reference books. Second semester: American state and municipal documents; publications of foreign governments. *I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 13a	2	—	—	—	—	11	—	11	—	309 Lib.	Reece

SECOND SEMESTER

Library Science 13b 2 — Schedule the same as for 13a (first semester).

15a-15b. Seminar in Library Economy.—Special problems; library economy publications. *I, II; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 15a	2		—	8-10	—	—	—	—	—	309 Lib.	Simpson and others

SECOND SEMESTER

Library Science 15b 2 — Schedule the same as for 15a (first semester).

16. Order, Accession, and Shelf Work.—Order department records and routine; book-buying; publishers and discounts; copyright; serials and continuations; gifts; exchanges; duplicates; the accession book and its substitutes; the shelf list and its uses; the care of pamphlets, clippings, and maps. *I; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 16	2		—	—	10	—	10	—	—	305 Lib.	Vought

17. Classification.—Principles of book classification; the Dewey Decimal Classification; the Cutter Expansion Classification; book numbers. *I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 17	3		—	8	—	8	—	8	—	305 Lib.	Bond

18. Cataloging.—Dictionary cataloging; subject headings; classed cataloging. *I; (3).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 18	3		—	10	—	10	—	10	—	305 Lib.	Bond

19. Trade Bibliography.—Books and periodicals used as tools of the book trade of America, England, Germany, and France. *II; (1).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 19	1		—	—	10	—	—	—	—	305 Lib.	Reece

20. Loan Department.—Records connected with the loan of books; representative loan systems; rules, regulations, and practises. *II; (1).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 20	1		—	—	—	—	10	—	—	305 Lib.	Bond

21. Printing, Binding, and Indexing.—*Printing:* Printing for libraries; preparing copy and reading proof. *Binding:* Materials and methods of book-binding for libraries; practise in preparing books for the bindery and in making necessary records. *Indexing:* Indexes; the form of citation; the choice and arrangements of headings; kind of type. *II; (2).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 21	2		—	—	—	8	—	8	—	305 Lib.	Windsor Bond

Library Science

22. Library Extension.—Methods; library associations; library schools; library commissions; township and county library systems; traveling libraries; home libraries; other agencies. *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 22	3	—	—	10	—	10	—	10	—	305 Lib.	Vought

23a-23b. Library Administration and Current Library Literature.—Current library periodicals, bulletins, reports, catalogs, and reading lists; the organization, reorganization, and administration of small libraries; the planning and equipment of reading rooms and small library buildings; library accounts and business forms. *I, II*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 23a	1	—	—	—	11	—	—	—	—	305 Lib.	Vought

SECOND SEMESTER

Library Science 23b 1 — Schedule the same as for 23a (first semester).

24a-24b. Selection of Books.—English translations of representative works of French, German, Spanish, Italian, and Russian novelists of the 19th century; examination of about forty newly published books. *I, II*; (2).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 24a	2	—	—	—	10	—	10	—	—	309 Lib.	Felsenthal

SECOND SEMESTER

Library Science 24b 2 — Schedule the same as for 24a (first semester). Drury

25. Advanced Classification and Cataloging.—Systems of book classification; rules for cataloging books. *II*; (1).

Prerequisite: Library 17, 18.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 25	1	—	—	—	—	—	10	—	—	309 Lib.	Bond

26a-26b. Library Administration.—Advanced order work; library organization; library architecture; legislative and municipal reference work; library work with children; special topics. *I, II*; (3).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 26a	3	—	—	10	—	10	—	10	—	—	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Simpson Drury Scott Reece </div> </div>

SECOND SEMESTER

Library Science 26b 3 — Schedule the same as for 26a (first semester).

27. Bibliographical Institutions.—Organization and work of bibliographical societies and institutions of America and Europe; co-operative bibliographical undertakings; international bibliography. *I*; (1).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science 27	1	—	—	—	—	—	8	—	—	309 Lib.	Reece

28. Practise Work.—Advanced practise work in certain departments of the University library. *II; *(1 to 4). Time to be arranged.*

MATHEMATICS

EDGAR JEROME TOWNSEND, PH.D., LL.D., *Professor*
 GEORGE ABRAM MILLER, PH.D., *Professor*
 HENRY LEWIS RIETZ, PH.D., *Professor*
 JAMES BYRNIE SHAW, D.Sc., *Associate Professor*
 CHARLES HIRSCHEL SISAM, PH.D., *Assistant Professor*
 ARNOLD EMCH, PH.D., *Assistant Professor*
 ROBERT D CARMICHAEL, PH.D., *Assistant Professor*
 ARTHUR ROBERT CRATHORNE, PH.D., *Associate*
 ERNEST BARNES LYTLE, PH.D., *Associate*
 GUSTAF ERIC WAHLIN, PH.D., *Associate*
 AUBREY JOHN KEMPNER, PH.D., *Associate*
 WILLIAM WELLS DENTON, PH.D., *Instructor*
 EDWARD WILSON CHITTENDEN, PH.D., *Instructor*
 LEVI THOMAS WILSON, PH.D., *Instructor*
 LYMAN M. KELLS, PH.D., *Instructor*
 JOHN ROGERS MUSSELMAN, PH.D., *Instructor*
 CLARENCE MARK HEBBERT, M.S., *Assistant*
 RAYMOND FRANKLIN BORDEN, A.M., *Assistant*
 JOHN SHERMAN BEEKLEY, A.B., *Assistant*
 CHARLES FRANCIS GREEN, A.M., *Assistant*
 CLARENCE HUDSON RICHARDSON, B.S., *Assistant*
 JESSIE MARIE JACOB, A.M., *Graduate Assistant*
 JOSEPH B. WONSETLER, A.B., *Graduate Assistant*
Cooperating:
 JOEL STEBBINS, PH.D., *Professor of Astronomy*
 FRANK WALTER REED, PH.D., *Instructor in Astronomy*

Major: 20 hours made up from any undergraduate courses offered by the department, except Mathematics 2, 4, and 8, and including Mathematics 7 and 9.

Minors: 20 hours selected from physics, chemistry, and astronomy.

2. College Algebra.— *I or II; (3).*

Prerequisite: Entrance algebra, $1\frac{1}{2}$ units; plane geometry, 1 unit.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Mathematics

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	2	3	*A1	8	—	8	—	8	—	419 N. H.	Wilson
			*A2	8	—	8	—	8	—	422 N. H.	Beekley
			*A3	8	—	8	—	8	—	423 N. H.	Hebbert
			*B1	9	—	9	—	9	—	431 N. H.	Emch
			*B2	9	—	9	—	9	—	418 N. H.	Chittenden
			*B3	9	—	9	—	9	—	420 N. H.	Wilson
			*D1	11	—	11	—	11	—	422 N. H.	Sisam
			*D2	11	—	11	—	11	—	420 N. H.	Chittenden
			*D3	11	—	11	—	11	—	432 N. H.	Kempner
			*D4	11	—	11	—	11	—	423 N. H.	Kells
			*E1	1	—	1	—	1	—	425 N. H.	Denton
			*E2	1	—	1	—	1	—	420 N. H.	Musselman
			*E3	1	—	1	—	1	—	431 N. H.	Richardson
			*F1	2	—	2	—	2	—	425 N. H.	Denton
			*F2	2	—	2	—	2	—	423 N. H.	Wahlin
			*F3	2	—	2	—	2	—	422 N. H.	Kells
			R1	8	—	8	—	8	—	432 N. H.	Kempner
			S1	9	—	9	—	9	—	422 N. H.	Reed
			S2	9	—	9	—	9	—	434 N. H.	Lytle
			S3	9	—	9	—	9	—	419 N. H.	Green
			T1	10	—	10	—	10	—	432 N. H.	Beekley
			T2	10	—	10	—	10	—	425 N. H.	Reed
			T3	10	—	10	—	10	—	431 N. H.	Hebbert
			W1	2	—	2	—	2	—	420 N. H.	Musselman
			W2	2	—	2	—	2	—	432 N. H.	Borden
			X1	3	—	3	—	3	—	423 N. H.	Wahlin

SECOND SEMESTER†

B1	9	—	9	—	9	—	422 N. H.	Sisam
D1	11	—	11	—	11	—	431 N. H.	Richardson
D2	11	—	11	—	11	—	422 N. H.	Wilson
G1	3	—	3	—	3	—	422 N. H.	Kells

4. Plane Trigonometry.—I or II; (2).

Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	4	2	*A1	—	8	—	8	—	—	419 N. H.	Wilson
			*A2	—	8	—	8	—	—	422 N. H.	Beekley
			*A3	—	8	—	8	—	—	423 N. H.	Hebbert
			*B1	—	9	—	9	—	—	423 N. H.	Carmichael
			*B2	—	9	—	9	—	—	418 N. H.	Chittenden
			*B3	—	9	—	9	—	—	420 N. H.	Wilson
			*D1	—	11	—	11	—	—	431 N. H.	Richardson
			*D2	—	11	—	11	—	—	420 N. H.	Chittenden
			*D3	—	11	—	11	—	—	432 N. H.	Kempner
			*D4	—	11	—	11	—	—	423 N. H.	Kells
			*E1	—	1	—	1	—	—	425 N. H.	Denton
			*E2	—	1	—	1	—	—	420 N. H.	Musselman
			*E3	—	1	—	1	—	—	431 N. H.	Richardson
			*F1	—	2	—	2	—	—	425 N. H.	Denton
			*F2	—	2	—	2	—	—	423 N. H.	Wahlin
			*F3	—	2	—	2	—	—	422 N. H.	Kells
			R1	—	8	—	8	—	—	432 N. H.	Kempner
			S1	—	9	—	9	—	—	422 N. H.	Reed
			S2	—	9	—	9	—	—	434 N. H.	Lytle
			S3	—	9	—	9	—	—	419 N. H.	Green
			T1	—	10	—	10	—	—	432 N. H.	Beekley
			T2	—	10	—	10	—	—	425 N. H.	Reed
			T3	—	10	—	10	—	—	431 N. H.	Hebbert
			W1	—	2	—	2	—	—	420 N. H.	Musselman
			W2	—	2	—	2	—	—	432 N. H.	Borden
			X1	—	3	—	3	—	—	423 N. H.	Wahlin

*For engineers.

†Provided primarily for those who fail the first semester.

SECOND SEMESTER†

B1	—	9	—	9	—	—	422 N. H. Musselman
D1	—	11	—	11	—	—	434 N. H. Lytle
D2	—	11	—	11	—	—	422 N. H. Wilson
G1	—	3	—	3	—	—	422 N. H. Kells

5. Teachers' Course.—Secondary algebra and geometry; their educational value; position in course; methods of teaching; correlation; comparison of American methods with those of foreign countries; order and importance of topics; text-books; literature. Lectures; discussions; reports. *I*; (2).

Prerequisite: Junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	5	2	—	—	11	—	11	—	—	434 N. H.	Lytle

6. Analytic Geometry.—Plane and solid analytic geometry. *II*; (5).

Prerequisite: Mathematics 2, 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	6	5	*A1	8	8	8	8	8	—	419 N. H.	Wilson
			*A2	8	8	8	8	8	—	422 N. H.	Green
			*A3	8	8	8	8	8	—	423 N. H.	Hebbert
			*B1	9	9	9	9	9	—	423 N. H.	Carmichael
			*B2	9	9	9	9	9	—	418 N. H.	Chittenden
			*B3	9	9	9	9	9	—	419 N. H.	Shaw
			*D1	11	11	11	11	11	—	420 N. H.	Crathorne
			*D2	11	11	11	11	11	—	418 N. H.	Chittenden
			*D3	11	11	11	11	11	—	432 N. H.	Borden
			*E1	1	1	1	1	1	—	425 N. H.	Richardson
			*E2	1	1	1	1	1	—	432 N. H.	Borden
			*E3	1	1	1	1	1	—	425 N. H.	Green
			*F1	2	2	2	2	2	—	425 N. H.	Denton
			*F2	2	2	2	2	2	—	423 N. H.	Wahlin
			*F3	2	2	2	2	2	—	422 N. H.	Kells
			R1	8	8	8	8	8	—	432 N. H.	Kempner
			S1	9	9	9	9	9	—	431 N. H.	Beekley
			S2	9	9	9	9	9	—	434 N. H.	Lytle
			T1	10	10	10	10	10	—	418 N. H.	Miller
			T2	10	10	10	10	10	—	419 N. H.	Reed
			W1	2	2	2	2	2	—	420 N. H.	Musselman
			X1	3	3	3	3	3	—	423 N. H.	Wahlin

7-9. Differential and Integral Calculus.—The principles developed and applied to functions of one and of several variables. (Section A1 is an honor section and may be selected by those specializing in mathematics or having an average grade of 90 in freshman mathematics.) *I*; (5); *II*; (3).

NOTE.—Two sections of Mathematics 7 are given the second semester.

Prerequisite: Mathematics 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	7	5	**A1	8	8	8	8	8	—	425 N. H.	Rietz
			A2	8	8	8	8	8	—	431 N. H.	Emch
			A3	8	8	8	8	8	—	420 N. H.	Crathorne
			A4	8	8	8	8	8	—	434 N. H.	Lytle
			A5	8	8	8	8	8	—	116 Ch.	Chittenden
			C1	10	10	10	10	10	—	434 N. H.	Townsend
			C2	10	10	10	10	10	—	422 N. H.	Sisam
			C3	10	10	10	10	10	—	419 N. H.	Shaw
			C4	10	10	10	10	10	—	423 N. H.	Carmichael
			F1	1	—	1	—	1	—	423 N. H.	Wahlin
			E2	1	1	1	1	1	—	422 N. H.	Kells

†Provided primarily for those who fail the first semester.

*For engineers.

**Honor section. See conditions given in description of course.

Mathematics

SECOND SEMESTER†

E1	1	1	1	1	1	—	420 N. H. Musselman
E2	1	1	1	1	1	—	431 N. H. Denton

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	9	3	*A1	8	—	8	—	8	—	425 N. H.	Rietz
			A2	8	—	8	—	8	—	418 N. H.	Chittenden
			A3	8	—	8	—	8	—	420 N. H.	Crathorne
			A4	—	8	—	8	—	8	420 N. H.	Musselman
			A5	—	8	—	8	—	8	431 N. H.	Emch
			C1	10	—	10	—	10	—	434 N. H.	Townsend
			C2	10	—	10	—	10	—	432 N. H.	Kempner
			C3	10	—	10	—	10	—	425 N. H.	Denton
			C4	10	—	10	—	10	—	423 N. H.	Carmichael
			E1	1	—	1	—	1	—	423 N. H.	Wahlin
			E2	1	—	1	—	1	—	422 N. H.	Kells

8. Differential and Integral Calculus.—(For students in chemistry and chemical engineering.) *I*; (5).

Prerequisite: Mathematics 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	8	5	C1	10	10	10	10	10	—	425 N. H.	Miller
			D1	11	11	11	11	11	—	425 N. H.	Musselman

9a. Differential and Integral Calculus.—(Second Course.) The definite (single and multiple) integral; the formation of problems in applied mathematics; line, surface, and volume integrals; the theorem of Stokes and Green; partial differentiation; exact integrals with applications of the conditions for exactness; elements of differential equations, approximate quadrature and integration of differential equations. *I*; (2).

Prerequisite: Mathematics 7 and 9, or 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	9a	2	B1	9	—	9	—	—	—	425 N. H.	Denton
			C1	—	10	—	10	—	—	418 N. H.	Crathorne
			C2	—	10	—	10	—	—	204 T. B.	Denton
			D1	—	11	—	11	—	—	419 N. H.	Shaw
			D2	—	11	—	11	—	—	422 N. H.	Wilson

Courses for Advanced Undergraduates and Graduates

10. Theory of Equations and Determinants.—Fundamental properties of an algebraic equation in one unknown; the solutions of systems of simultaneous equations; theory of a system of linear equations; some fundamental properties of determinants. *II*; (3).

Prerequisite: Mathematics 7 and 9, or 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	10	3	—	11	—	11	—	11	—	116 Ch.	Miller

†Provided primarily for those who fail the first semester.

*Honor section. See conditions given in description of course, p. 241.

16-17. Differential Equations and Advanced Calculus.—Ordinary and partial differential equations; special topics of calculus, of value in the application of mathematics. *I, II; (3).*

Prerequisite: Mathematics 7 and 9, or 8.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Mathematics	16	3	—	2	—	2	—	2	—	434 N. H.

SECOND SEMESTER										
Mathematics	17	3	—	Schedule the same as for 16 (first semester).						

18. Constructive Geometry.—Development and training of space perception; properties of lines, planes, and the simpler surfaces of the second order, studied by methods of parallel and central projection; graphical interpretation of the processes of analytic geometry; analytic discussion of the methods of descriptive geometry. *II; (3).*

Prerequisite: Mathematics 6.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Mathematics	18	3	—	—	10	—	10	—	10	431 N. H.

19. Solid Analytic Geometry.—Equations of the plane and right line in space; properties of surfaces of the second degree; the classification and special properties of quadrics; the theory of surfaces. *II; (3).*

Prerequisite: Mathematics 10.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Mathematics	19	3	—	10	—	10	—	10	—	422 N. H.

21. Method of Least Squares.—Law of probability and error; adjustment of observations; precision of observation; independent and conditional observations. *I; (2).*

Prerequisite: Mathematics 7 and 9, or 8.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Mathematics	21	2	—	—	2	—	2	—	—	Obs.

23. Averages and Mathematics of Investment.—Meaning, use, and abuse of different kinds of averages; their relation to the theory of probability; application of the elements of probability to annuities, insurance, and branches of science; loans and investments; problems in the evaluation of investment securities. *II; (3).*

Prerequisite: Mathematics 2; junior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Mathematics	23	2	—	9	—	9	—	9	—	420 N. H.

30-31. Actuarial Theory.—Mathematical treatment of life contingencies; construction of life tables, and of monetary tables; valuation of policies to meet statutory requirements; mathematical theory of risk; distribution of surplus; preparation of annual reports; inheritance taxes; old age pensions; workmen's compensation; theory and practise of investing the funds of an insurance company. *I, II; (3).*

Prerequisite: Mathematics 7 and 9, or 8, 23.

Mathematics

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	30	3	—	9	—	9	—	9	—	207 Com.	Rietz

SECOND SEMESTER

Mathematics 31 3 Schedule the same as for 30 (first semester).

32. History of Mathematics.—The elementary subjects; rise and growth of the higher mathematics chiefly in the nineteenth century; biography of persons influential in this development. Lectures; reports on assigned reading. *II*; (2).

Prerequisite: Twenty hours of mathematics.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	32	2	—	—	8	—	8	—	—	434 N. H.	Lytle

Courses for Graduates

100. Seminar and Thesis.—*Three times a week; I, II; (1 or 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	100	1 or 2 units	—	—	—	—	—	—	—	—	Professors in department

101. Functions of Real Variables.—A general introductory course in the functions of real variables, including a critical study of the fundamental processes of analysis and a discussion, based upon the theory of assemblages, of the existence proofs in differential and integral calculus. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 16, 17.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	101	1 unit	—	3	—	3	—	3	—	435 N. H.	Townsend

111. Automorphic Functions.—First semester: The group-theoretic side of the theory. Second semester: Function-theoretic developments and applications. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 24, 25, 110, and preferably 27-28.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	111	1 unit	—	10	—	10	—	10	—	435 N. H.	Emch

113. Theory of Linear Differential Equations.—Oscillation theorems for ordinary linear equations of the second order in real variables; general existence theorems and function-theoretic considerations of ordinary linear equations of order in complex variables; general theory of linear partial differential equations. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 24-25.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	113	1 unit	—	11	—	11	—	11	—	435 N. H.	Carmichael

120. Elementary Theory of Groups.—Groups in arithmetic, geometry, and trigonometry; groups which can be represented with a small number of let-

ters; the abstract group theory; the Galois theory of equations. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 33-34.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	120	1 unit	—	9	—	9	—	9	—	435 N. H.	Miller

122. Modern Algebra.—Theory of matrices; system of linear equations; bilinear and quadratic forms; properties of polynomials; algebraic invariants; elementary divisors. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 7, 9, 10.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	122	1 unit	—	9	—	9	—	9	—	432 N. H.	Kempner

130. Invariants and Higher Plane Curves.—Algebraic curves; application of the theory of invariants to higher plane curves; curves of the third and fourth order. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 16, 27.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	130	1 unit	—	8	—	8	—	8	—	435 N. H.	Sisam

132. Projective Geometry.—Fundamental concepts; anharmonic ratio; projective pencils and ranges; transformations and groups; theory of conics and quadric surfaces; pencils and ranges of conics; quadratic transformations and projective theory of cubics; applications in mechanics. *Three times a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	132	1 unit	—	10	—	10	—	10	—	420 N. H.	Crathorne

141. Vector Methods.—The algebras of quaternions, space analysis, and dyadics; differentiation and integration; rational mechanics, elasticity, hydrodynamics, electrodynamics. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 16-17.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	141	1 unit	—	2	—	2	—	2	—	435 N. H.	Shaw

MECHANICAL ENGINEERING

CHARLES RUSS RICHARDS, M.M.E., *Professor*

GEORGE ALFRED GOODENOUGH, M.E., *Professor, Thermodynamics*

BRUCE WILLET BENEDICT, B.S., *Director, Shop Laboratories*

OSCAR ADOLPH LEUTWILER, M.E., *Professor, Machine Design*

ARTHUR CUTTS WILLARD, B.S., *Assistant Professor, Heating and Ventilation*

ELISHA NOEL FALES, A.B., S.B., *Assistant Professor, Aeronautics*

JOHN ADLUM DENT, M.E., *Associate*

ALONZO PLUMSTED KRATZ, M.S., *Research Associate, Engineering Experiment Station*

HARRY FREDERICK GODEKE, B.S., *Instructor*

Mechanical Engineering

EDWIN FRANK, B.S., *Instructor*

HARRY WILLIAM WATERFALL, B.S., *Instructor, Machine Design*

HORATIO SPRAGUE MCDWELL, M.M.E., *Instructor*

ARTHUR C. HARPER, B.S., *Instructor, Machine Design*

LESTER CLYDE LICHTY, B.S., M.S., *Instructor, Mechanical Engineering*

EDGAR THOMAS LANHAM, *Instructor, Forge Practise*

ROBERT EDWIN KENNEDY, *Instructor, Foundry Practise*

GUSTAVE ADOLPH GROSS, *Instructor, Pattern Making*

GUSTAVE HOWARD RADEBAUGH, *Instructor, Machine Practise*

JAMES HARVEY HOGUE, *Instructor, Foundry Practise*

JEREMIAH AMOS DE TURK, *Instructor, Machine Practise*

LEROY ALONZO WILSON, M.M.E., *First Assistant, Engineering Experiment Station*

JAMES MERION DUNCAN, *Assistant, Pattern Making*

PETER JOSEPH REBMAN, *Assistant, Forge Practise*

JOHN ALEXANDER FRISK, *Assistant and Mechanician*

1. Steam and Air Machinery.—The construction, operation, and care of boilers, engines, and air compressors; elementary thermodynamics; steam engine performance; transmission of compressed air and its applications. (For students in civil and mining engineering.) *I*; (3).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	1	3	EF	2	—	2	—	2	—	308 E. H.	—
			GHU	—	8	—	8	—	8	308 E. H.	—
			O	—	10	—	10	—	10	308 E. H.	—
			Z	8	—	8	—	8	—	308 E. H.	—

2. Steam Engineering.—Engines, boilers, pumps, condensers, and other steam machinery. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	2	3	K T	—	11	—	11	—	11	101 E. H.	—
			L V	9	—	9	—	9	—	101 E. H.	—
			M N	—	10	—	10	—	10	305 E. H.	—

3. Steam Engineering.—The theory of the steam engine, steam turbine, and other steam machinery. (For students in mechanical engineering.) *I*; (3).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	3	3	P	9	—	9	—	9	—	305 E. H.	—
			Q	8	—	8	—	8	—	305 E. H.	—

11. Thermodynamics and Heat Engines.—(For students in electrical engineering.) *I*; (3).

Prerequisite: Mechanical Engineering 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	11	3	KN	9	—	9	—	9	—	308 E. H.	—
			LMV	11	—	11	—	11	—	308 E. H.	—

12. Thermodynamics.—The transformation of heat into work; the second law and its connection with irreversible processes; the properties of heat media; the perfect gases; saturated and superheated vapors; the flow of fluids. *II*; (5).

Prerequisite: Mathematics 9a; Theoretical and Applied Mechanics 27.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
M. E.	12	5	P	8	9	9	9	9	—	308 E. H.
			Q W	11	11	11	11	11	—	308 E. H.

15. Gas Power Engineering.—Internal combustion engines; liquid and gaseous fuels and their combustion; gas producers. *I*; (3).

Prerequisite: Mechanical Engineering 12.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
M. E.	15	3	P Q	11	—	11	—	11	—	305 E. H.

23. Mechanical Equipment of Buildings.—Theory and practise of designing simple systems for the mechanical equipment of buildings, including heating and ventilation, refrigeration, fire protection, vacuum cleaning, elevators, lighting, and small power plants. Lectures; laboratory. *I*; (5).

Prerequisite: Senior standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
M. E.	23	5	C	—	11	—	11	11	8-11	M. L.
			D	—	11	—	11	8-12	—	M. L.

25. Heating and Ventilation for Architects.—The theory and the application of the principles of heating and ventilation to modern practise. Direct and indirect steam and hot water heating; furnace heating; ventilation and air analysis; air condition; temperature and humidity control. *I*; (2).

Prerequisite: Senior standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
M. E.	25	2	A	11	—	11	—	—	—	M. L.

26. Heating and Ventilation.—The theory and the application of the principles of heating and ventilation to modern practise. Steam boilers and water heaters of steel and cast iron for heating service; heat losses from buildings; direct and indirect steam and hot water heating, using gravity systems; furnace heating; fan blast or mechanical indirect systems; exhaust steam heating; district heating by steam and water; ventilation and air analysis; air conditioning; temperature and humidity control. *II*; (3).

Prerequisite: Mechanical Engineering 65.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
M. E.	26	3	P	9	—	9	—	9	11	M. L.
			Q	2	—	2	—	2	11	M. L.

30. Mechanics of Machinery.—Mechanisms and mechanical movements; cams, gears, valve gears, and quick-return motions; graphical constructions for displacement, velocity, and acceleration; kinetics of the steam engine mechanism

Mechanical Engineering

and similar mechanisms; balancing; critical speeds; force and mass reduction. *II*; (5).

Prerequisite: Theoretical and Applied Mechanics 27.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	30	5	P	11	10-12	11	10-12	11	—	305 E. H.	—
			Q	9	8-10	9	8-10	9	—	305 E. H.	—

32. Power Transmission.—Shafting, belts, ropes, cables, water, air, gas, and steam as power transmitters; the measurement and storage of power. *II*; (3).

Prerequisite: Mechanical Engineering 12 and 43.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	32	3	P Q	11	—	11	—	11	—	M. L.	—

37. Principles of Management.—Industrial development; modern industrial tendencies; principles of organization; selection and compensation of labor; application of science to industrial problems; practical shop systems of management; production. *I*; (3).

Prerequisite: Mechanical Engineering 81, 82.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	37	3	P Q W	11	—	11	—	11	—	W. S.	—

43. Engineering Design.—Theory of machine design, with application; investigation of actual machines similar to the one to be designed; design of machinery subjected to heavy and variable stresses; punches, shears, presses, riveters, and cranes. *I*; (5).

Prerequisite: Theoretical and Applied Mechanics 29; Mechanical Engineering 30.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	43	5	P	1-4	11	1-4	11	1-4	—	305 E. H.	—
										308 E. H.	—
			Q	1-4	1	1-4	1	1-4	—	309 E. H.	—
										312 E. H.	—

44. Engineering Design.—Design and commercial application of special tools, fixtures, jigs, dies, and gauges used in modern high production manufacturing. *II*; (2).

Prerequisite: Mechanical Engineering 37 and 43.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	44	2	P Q	—	8-11	—	8-11	—	—	309 E. H.	—

52. Power Plant Design.—Study and design of some form of steam power plant. *II*; (3).

Prerequisite: Mechanical Engineering 43 and 65.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	52	3	P	1-4	—	1-4	—	1-4	—	309 E. H.	—
			Q	8-11	—	8-11	—	8-11	—	309 E. H.	—

61. Power Measurement.—The testing and calibration of instruments and apparatus; use of the indicator; calculation of horse-power and steam consumption; reading of indicator diagrams; valve setting. (For students in electrical engineering.) *I*; (2).

Prerequisite: Mechanical Engineering 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	61	2	K M V	—	—	1-4	—	—	8-11	M. L.	—
			L N	1-4	—	—	1-4	—	M. L.	—	
			T	—	1-4	—	1-4	—	M. L.	—	

62. Power Measurement and Steam Engines.—Laboratory work, substantially the same as that given in Mechanical Engineering 61, supplemented by lectures on steam machinery. *II*; (3).

Prerequisite: Junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	62	3	X W	—	8-11	—	8-11	—	8	M. L.	—

64. Power Measurement.—Apparatus for engine and boiler tests—scales, thermometers, indicators, brakes and dynamometers, gauges, calorimeters; methods of calibrating and using such apparatus; tests for horse-power of steam engines; pumps, and gas engines. Reports. *II*; (3).

Prerequisite: Mechanical Engineering 2; registration in Mechanical Engineering 12 or Chemistry 31.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	64	3	Q Z	1-5	—	—	—	1-5	—	M. L.	—
			P	—	1-5	—	1-5	—	M. L.	—	

65. Power Laboratory.—Experiments on engines, turbines, gas engines, pumps, boilers, injectors, air compressors, hoisting appliances, heating apparatus, and the refrigerating machines. *I*; (3).

Prerequisite: Mechanical Engineering 12 and 64.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	65	3	P	—	1-5	—	1-5	—	—	M. L.	—
			Q	—	8-12	—	8-12	—	—	M. L.	—

66. Power Laboratory.—Special research work in the mechanical engineering laboratory. *II*; (2).

Prerequisite: Mechanical Engineering 65; senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	66	2	P O	—	8-11	—	8-11	—	—	M. L.	—

71. Forge Work for Agricultural Students.—Forging and welding; tempering tools; pointing and hardening cultivator shovels, plow shares. *Six hours a week, either half of I or II*; (1). *Time to be arranged.*

73. Wood Work for Agricultural Students.—Carpentry for the farmer; use of tools; layout and construction of building joints; repairs to buildings and equipment. *Six hours a week, either half of I or II*; (1). *Time to be arranged.*

Mechanical Engineering

75. Forge Work.—(9 weeks.) Hand and power forging and welding of metals; heat treatment of carbon and high speed steels in modern gas, electric, and cyanide furnaces; case carbonizing. *I or II; (1).*

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	75	1	KLZ	—	8-11	—	8-11	—	8,9	M. S.	—
			MN	—	1-4	—	1-4	—	10,11	M. S.	—
			PO	1-4	—	1,2	—	1-4	—	M. S.	—

77. Foundry Work.—(9 weeks.) Modern foundry practise; bench, floor, and machine moulding; all branches of core making; operation of cupola and brass furnace; casting of iron, brass, and alloys. *I or II; (2).*

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	77	2	KLZ	—	8-11	—	8-11	—	8,9	M. S.	—
			MN	—	1-4	—	1-4	—	10,11	M. S.	—
			PO	1-4	—	1-2	—	1-4	—	M. S.	—

79. Pattern Work.—(18 weeks.) Hand and machine methods in the production of useful patterns. *I or II; (3).*

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	79	3	KLZ	—	8-11	—	8-11	—	8,9	W. S.	—
			MN	—	1-4	—	1-4	—	10,11	W. S.	—
			PQ	1-4	—	1,2	—	1-4	—	W. S.	—

81. Machine Work.—Modern manufacturing methods; machine operation; shop management; organization; production methods; dispatching work; ordering, storing, and routing materials; time studies; shop accounting; inspection and all activities of the machine department of a manufacturing plant. *I; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	81	3	P W	1-4	—	1,2	—	1-4	—	M. S.	—
			Q	—	1-4	—	1-4	—	10,11	M. S.	—

82. Machine Work.—(Continuation of 81). *II; (2).*

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	82	2	P	1-4	—	1,2	—	1-4	—	M. S.	—
			O W	—	1-4	—	1-4	—	10,11	M. S.	—

98. Thesis.—Investigation of special subject and preparation of thesis embodying a review of the literature of the subject, the results of investigation, and a discussion of those results. *II; (3). Time to be arranged.*

99. Inspection Trip.—*I; (no credit).*

Prerequisite: Senior standing.

Courses for Graduates

Entrance upon graduate work in mechanical engineering presupposes the full undergraduate course in that subject.

106. Heat Motors.—The internal combustion motor; steam turbine. Principles and methods of refrigeration. *Twice a week; I; (1 unit). Time to be arranged.*

107. Thermodynamics.—Thermodynamics; their application to the solution of physical and engineering problems. *Twice a week; I; (1 unit). Time to be arranged.*

109. Machine Design.—Rational design; the application of mechanics of materials. Individual problems. *Twice a week; I or II; (1 unit). Time to be arranged.*

112. Laboratory Investigation.—Combustion of fuel; boiler economy; steam engines and turbines; gas engines and producers; properties of explosive mixtures; mechanical refrigeration. Original work. *Three times a week; I, II; (1½ units). Time to be arranged.*

114. Dynamics of Machinery.—Advanced problems. Balancing; whirling and vibration of shafts; theory of governors; fly wheels; force and mass reduction; stresses in rotating masses. *Twice a week; I, II; (1 unit). Time to be arranged.*

MECHANICS, THEORETICAL AND APPLIED

ARTHUR NEWELL TALBOT, C.E., D.Sc., *Professor, Municipal and Sanitary Engineering; in charge of Theoretical and Applied Mechanics*

HERBERT FISHER MOORE, M.M.E., *Professor*

MELVIN LORENIUS ENGER, C.E., *Assistant Professor*

VIRGIL R FLEMING, B.S., *Associate*

FRED B SEELY, M.S., *Associate*

GEORGE PAUL BOOMSLITER, M.S., *Associate*

NEWTON EDWARD ENSIGN, A.B., B.S., *Associate*

CLARENCE EUGENE NOERENBERG, A.B., A.E., *Instructor*

ALEX VALLANCE, M.E., *Instructor*

WILLIAM JAMES PUTNAM, B.S., *Instructor*

1. Analytical Mechanics.—Especially designed for graduates and advanced undergraduates in Arts and Sciences. *I; (3). Time to be arranged.*

MR. ENSIGN

Prerequisite: Mathematics 8 or 9.

2. Analytical Mechanics.—(A continuation of Theoretical and Applied Mechanics 1.) *Lamb's Dynamics. II; (3). Time to be arranged.* MR. ENSIGN.

Prerequisite: Theoretical and Applied Mechanics 1.

10. Hydraulics.—The pressure and flow of water; its utilization as motive power; observation and measurement of pressure, velocity, and flow; power and efficiency; determination of experimental coefficients. Laboratory weekly. *II; (3).*

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 21.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	10	3	E, Quiz	—	10	—	10	—	—	202 L. A. M.	Enger and others
			Laboratory	—	—	—	8,9	—	—		
			F, Quiz	—	1	—	1	—	—	202 E. H.	
			Laboratory	—	10,11	—	—	—	—		
			G, Quiz	—	2	—	2	—	—	202 L. A. M.	
			Laboratory	—	—	—	10,11	—	—		
			T, Quiz	—	10	—	10	—	—	208 E. H.	
			Laboratory	1,3	—	—	—	—	—		

Mechanics, Theoretical and Applied

14. Elements of Mechanics.—Kinematics, kinetics, and statics. (For architects and others who have not taken the calculus.) *II*; (4).

Prerequisite: Mathematics 2, 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	14	4	A	—	—	8	8	8	8	219 E. H.	Boomsliter Gardner
			B	—	8	8	8	8	—	215 T. B.	
			D	—	1	1	1	1	—	105 T. B.	

15-16. Strength of Materials.—Graphical methods of determining the elastic curve of beams; centroids and moments of inertia of areas; reinforced concrete beams and columns; properties and tests of engineering materials. (For students in architecture and others without the prerequisites required for Theoretical and Applied Mechanics 29.) Laboratory every other week. *I, II*; (3).

Prerequisite: Theoretical and Applied Mechanics 14.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	15	3	A	10	—	10	—	10,11	—	302 L. A. M.	Noeren- berg
			B	—	10	—	10	—	10,11	302 L. A. M.	

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	16	3	A	10	—	10	—	10,11	—	302 L. A. M.	Noeren- berg
			B	—	10	—	10	—	10,11	302 L. A. M.	

20. Analytical Mechanics.—The mechanics of engineering rather than that of astronomy and physics. Fundamental concepts; equilibrium, centroids and center of gravity, friction; engineering problems; statement of conditions and use of data. *II*; (3).

Prerequisite: Mathematics 7; registration in Mathematics 9.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M	20	3	C	—	9	—	9	—	9	302 L. A. M.	Ensign and others
			D	—	9	—	9	—	9	202 E. H.	
			E	—	1	—	1	—	10	202 L. A. M.	
			F	—	8	—	8	—	8	202 L. A. M.	
			G	—	8	—	8	—	8	202 E. H.	
			K	—	11	—	11	—	11	202 L. A. M.	
			L	—	11	—	11	—	11	208 E. H.	
			M	8	—	8	—	8	—	202 E. H.	
			N	10	—	10	—	10	—	202 L. A. M.	
			P	—	10	—	10	—	10	202 E. H.	
			Q	8	—	8	—	8	—	101 E. H.	
			X	10	—	10	—	10	—	208 E. H.	
			Y	8	—	8	—	8	—	302 L. A. M.	
			Z	10	—	10	—	10	—	202 E. H.	

21. Analytical Mechanics.—Continuation of Theoretical and Applied Mechanics 20. Kinematics and kinetics. *I*; (2).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

Mechanics, Theoretical and Applied

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
T. & A. M.	21	2	E	—	1	—	1	—	—	202 E. H.
			F	—	8	—	8	—	—	202 L. A. M.
			G	—	10	—	10	—	—	305 E. H.
			H	—	9	—	9	—	—	302 L. A. M.
			P	—	8	—	8	—	—	202 E. H.
			Q	—	9	—	9	—	—	202 E. H.
			X	—	8	—	8	—	—	302 L. A. M.
			Z	—	10	—	10	—	—	202 E. H.

Boom-
sliter
and
others

25. Resistance of Materials.—A briefer course than Theoretical and Applied Mechanics 29. (For students in architectural, ceramic, chemical, electrical, and mining engineering.) *I*; (4).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F	S	
T. & A. M.	25	4	C	10	—	10	—	10	—	202 L. A. M.
			Laboratory	—	—	—	—	8,9	—	
			D, Quiz	1	—	1	—	1	—	202 L. A. M.
			Laboratory	—	—	—	—	2,3	—	
			K, Quiz	8	—	8	—	8	—	302 L. A. M.
			Laboratory	—	8,9	—	—	—	—	
			L, Quiz	10	—	10	—	10	—	205 E. H.
			Laboratory	8,9	—	—	—	—	—	
			M, Quiz	—	9	—	9	—	9	202 L. A. M.
			Laboratory	1,2	—	—	—	—	—	
			N, Quiz	8	—	8	—	8	—	205 E. H.
			Laboratory	—	—	10,11	—	—	—	
			X, Quiz	11	—	11	—	11	—	202 L. A. M.
			Laboratory	—	10,11	—	—	—	—	
			Z, Quiz	10	—	10	—	10	—	202 E. H.
			Laboratory	—	—	—	—	—	8,9	

Boom-
sliter
and
others

26. Analytical Mechanics and Hydraulics.—Kinematics, kinetics, and hydraulics; problems; experiments in the hydraulic laboratory. (For students in architectural engineering, electrical engineering, and mining engineering.) Laboratory weekly during the last half of the semester. *II*; (4).

Prerequisite: Theoretical and Applied Mechanics 25.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F	S	
T. & A. M.	26	4	C, Quiz	10	—	10	—	10	—	105 T. B.
			Laboratory	—	—	—	—	—	8,9	101 E. H.
			D, Quiz	1	—	1	—	1	—	202 E. H.
			Laboratory	—	—	—	—	8,9	—	208 E. H.
			K, Quiz	9	—	9	—	9	—	202 E. H.
			Laboratory	—	8,9	—	—	—	—	208 P. L.
			L, Quiz	8	—	8	—	8	—	202 L. A. M.
			Laboratory	—	—	—	—	1,2	—	302 L. A. M.
			M, Quiz	—	11	—	11	—	11	202 E. H.
			Laboratory	—	1,2	—	—	—	—	302 L. A. M.
			N, Quiz	—	8	—	8	—	8	302 L. A. M.
			Laboratory	—	—	—	1,2	—	—	302 L. A. M.

Seely
and
others

29. Resistance of Materials.—The mechanics of materials; the properties and requirements for materials of construction; the effect of methods of manufacture upon the quality of the material; specifications and standard tests; experiments and investigations in the materials laboratory. (For students in civil engineering, mechanical engineering, and municipal and sanitary

Mechanics, Theoretical and Applied

engineering.) Recitations; lectures; assigned reading; laboratory weekly. I; (5).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20; registration in Theoretical and Applied Mechanics 21.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
T. & A. M.	29	5	*Lecture	—	—	11	—	—	—	—	228 U. H.	Talbot and others
			E, Quiz	1	—	1	—	1	—	202 E. H.		
			Laboratory	—	—	—	8,9	—	—	—		
			F, Quiz	8	—	8	—	8	—	202 L. A. M.		
			Laboratory	—	—	—	1,2	—	—	—		
			G, Quiz	10	—	10	—	10	—	305 E. H.		
			Laboratory	—	—	8,9	—	—	—	—		
			H, Quiz	9	—	9	—	9	—	302 L. A. M.		
			Laboratory	10,11	—	—	—	—	—	—		
			P, Quiz	8	—	8	—	8	—	202 E. H.		
			Laboratory	—	1,2	—	—	—	—	—		
			Q, Quiz	9	—	9	—	9	—	202 E. H.		
			Laboratory	—	—	1,2	—	—	—	—		

36. Analytical Mechanics.—The portion of Theoretical and Applied Mechanics 26, which involves analytical mechanics. (Open only to railway electrical engineering students.) II; (2).

Prerequisite: Theoretical and Applied Mechanics 25.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
T. & A. M.	36	2	V	8	—	8	—	8	—	202 L. A. M.	Vallance
				—	—	—	—	1.2	—	302 L. A. M.	

Courses for Graduates

Entrance upon graduate work in theoretical and applied mechanics presupposes a full undergraduate course in that subject.

101. Analytical Mechanics.—Methods; problems and applications; critical and comparative study of texts. *Twice a week; I; (1 unit). Time to be arranged.* Professor MOORE

102. Resistance of Materials.—Properties of materials used in engineering construction and the methods of determining these properties; analysis and investigation in mechanics of materials; the effect of form of member in a structure or machine; the method of application of forces; comparative study of texts. *Twice a week; II; (1 unit). Time to be arranged.* Professor MOORE

103. Hydraulics and Hydraulic Engineering.—The laws of hydraulics and their application to engineering problems; hydraulic power and its development; design and investigation. *Twice a week; II; (1 unit). Time to be arranged.* Professor TALBOT

104. Experimental Work in the Laboratory of Applied Mechanics.—Investigation on materials and on their action as used in machines and structures; experiments with pumps, motors, and measuring devices; investigation of the laws of hydraulics, the development of power, and the study of various hydraulic problems. *Twice a week; I, II; (½ to 2 units). Time to be arranged.* Professor MOORE

*Each student taking the course must enroll in the lecture section.

105. Experimental and Analytical Work in Reinforced Concrete.—Research; interpretation of available experimental results and their application to the design of structures; principles of construction. *Twice a week; I, II; (½ unit or more).* Time to be arranged. Professor TALBOT

METEOROLOGY

(See under GEOLOGY.)

MILITARY SCIENCE

ROBERT WALTER MEARNs, Major 12th Infantry, *Professor and Commandant*
FREDERICK WILLIAM POST, 1st Sergeant, U. S. A., retired, *Administrative Assistant*

1. Theoretical Instruction.—Infantry Drill Regulations. For all freshman men. *II; (1).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Military	1	1	A	11	—	—	—	—	—	*
			B	—	11	—	—	—	—	■
			C	—	—	11	—	—	—	■
			D	—	—	—	11	—	—	**
			E	—	—	—	—	11	—	†
			F	3	—	—	—	—	—	†
			G	—	3	—	—	—	—	†
			H	—	—	3	—	—	—	†
			I	—	—	—	3	—	—	†
			J	—	—	—	—	3	—	†

Mearns

2a-2b-2c-2d. Practical Instruction.—*Infantry.*—Infantry drill regulations; small-arm firing regulations; bayonet exercises; ceremonies. *Artillery.*—School of the Cannoneer and battery dismounted. *Signal Company.*—Flag; telegraph; wireless; heliograph. *Engineer Company.*—Field engineering; map reading; entrenchments; bridge building. *Hospital Company.*—U. S. Army Hospital Corps Drill Regulations. Freshman and sophomore years. Two drill periods a week. *I, II; (1).*

FIRST SEMESTER (FRESHMEN)										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Military	2a	1	(See Note)	4	4	4	4	—	—	Armory

Mearns

SECOND SEMESTER (FRESHMEN)										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Military	2b	1	(See Note)	4	4	4	4	—	—	Armory

Mearns

NOTE.—Freshmen must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions in the regiments will be made by the Commandant.

FIRST SEMESTER (SOPHOMORES)										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Military	2c	1	(See Note)	4	4	4	4	—	—	Armory

Mearns

*105, 215 T. B., 205 E. E., 104 P. L.

**215 T. B., 205 E. E., 302 L. A. M., 104 P. L.

†105, 215 T. B., 205 E. E., 208 E. H.

‡105, 203, 215 T. B., 108 P. L.

Mining Engineering

SECOND SEMESTER (SOPHOMORES)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	2d	1	(See Note)	4	4	4	4	—	—	Armory	Mearns

NOTE.—Sophomores must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions in the regiments are made by the Commandant according to circumstances.

3a-3b. Theoretical Instruction.—For sophomores: Infantry drill regulations; small-arm firing regulations. For juniors and seniors: Field Service Regulations. This course is obligatory upon commissioned officers and sergeants, recommended to corporals, and open to others. *I, II*; (no credit).

Authorized Text-Books.—U. S. Army Infantry Drill Regulations; Army Regulations; Field Service Regulations; Guard Manual; Small-Arms Firing Regulations; Field Engineering (Beach); Hospital Drill Regulations; Manual of Military Training (Moss).

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	3a	A (sophomores)		10	—	—	—	—	—	105 T. B.	Mearns
		B (sophomores)		—	10	—	—	—	—	102 E. H.	
		C (sophomores)		—	—	10	—	—	—	105 T. B.	
		D (sophomores)		—	—	3	—	—	—	105 T. B.	
		E (sophomores)		—	—	—	3	—	—	305 E. H.	
		F (sophomores)		—	—	—	—	3	—	305 E. H.	
		G (juniors)		—	—	—	10	—	—	102 E. H.	
		H (juniors)		—	—	—	—	10	—	105 T. B.	
		I (juniors)		—	3	—	—	—	—	305 E. H.	
		J (seniors)		3	—	—	—	—	—	305 E. H.	

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Military	3b	A (sophomores)		10	—	—	—	—	—	305 E. H.	Mearns
		B (sophomores)		—	10	—	—	—	—	219 E. H.	
		C (sophomores)		—	—	10	—	—	—	305 E. H.	
		D (sophomores)		—	—	3	—	—	—	305 E. H.	
		E (sophomores)		—	—	—	3	—	—	305 E. H.	
		F (sophomores)		—	—	—	—	3	—	305 E. H.	
		G (juniors)		—	—	—	10	—	—	219 E. H.	
		H (juniors)		—	—	—	—	10	—	305 E. H.	
		I (juniors)		—	3	—	—	—	—	305 E. H.	
		J (seniors)		3	—	—	—	—	—	305 E. H.	

MINERALOGY

(See GEOLOGY 5, 5a, 6, 7.)

MINING ENGINEERING

HARRY HARKNESS STOEK, B.S., E.M., *Professor*

ELMER ALLEN HOLBROOK, S.B., E.M., *Assistant Professor*

CLINTON MASON YOUNG, B.S., E.M., *Assistant Professor, Mining Research*

ALFRED COPELAND CALLEN, E.M., M.S., *Instructor*

1. Earth and Rock Excavation.—Explosives; blasting; boring; tunneling; shaft-sinking; coal-cutting; timbering and prospecting. *I, (3)*. Mr. CALLEN

Prerequisite: Chemistry 1a or 1b; Geology 13a and 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	1	3	—	11	—	11	—	11	—	—	Callen

3. Mining Principles.—Terminology; explosives; blasting; drilling; tunneling; shaft-sinking; mining and timbering of flat deposits. (For students in engineering courses other than mining.) *I*; (2).

Prerequisite: Chemistry 1a or 1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	3	2	—	8	—	8	—	—	—	206 T. B.	Callen

4. Mining Methods.—Mining and timbering of bedded, vein, and placer deposits. *II*; (3).

Prerequisite: Mining 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	4	3	—	10	—	10	—	10	—	206 T. B.	Stoek

5. Mine Ventilation.—Mine gases; safety lamps; mine ventilation; lighting and signaling; explosions and mine fires; rescue work and first aid. Laboratory work. *I*; (3).

Prerequisite: Chemistry 1a or 1b, 4; Physics 1a-1b, 3a-3b; Mining 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	5	3	—	9	—	9	—	—	—	206 T. B.	Stoek
			—	—	—	1-4	—	—	—	210 T. B.	Callen

6. Mechanical Engineering of Mines.—Hoisting: Ropes, cages, hoisting engines, and other appliances. Haulage: the different systems used underground and on the surface; the methods of loading and unloading; mine stables; transportation of workmen. Drainage of mines: mine dams, mine pumps. *II*; (2).

Prerequisite: Mechanical Engineering 1, or equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	6	2	—	—	8	—	8	—	—	206 T. B.	Callen

8. Mine and Metallurgical Law, Administration, and Accounts.—Laws governing location, ownership, and policing of mines. Trade agreements, relations between employers and employees. Sociology. Accounts and cost sheets. *II*; (3).

Prerequisite: Mining 3 or 4 or Geology 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	8	3	—	8	—	8	—	8	—	206 T. B.	Stoek
											Holbrook

9. Preparation of Coal and Ores.—History, principles, processes, machines; applications to dry coal preparation and coal washing. Breaking, sizing, and concentrating ores. Laboratory practise in coal washing. *I*; (3).

Prerequisite: Chemistry 5; Physics 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	9	3	—	—	—	10	—	10	—	206 T. B.	Holbrook
			—	1-4	—	—	—	—	—	Min. L.	

Mining Engineering

13. Utilization of Fuels.—The manufacture, handling, and utilization of wood, charcoal, peat, lignite, bituminous coal, anthracite, coke, petroleum, natural and artificial gas, and refractories in mining and metallurgical practise. *II*; (2).

Prerequisite: Junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	13	2	—	—	—	11	—	11	—	207 T. B.	Holbrook

15. Principles of Mine Ventilation.—Mine ventilation, signaling, and lighting. *I*; (1).

Prerequisite: Physics 3a-3b; Mining 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	15	1	—	10	—	—	—	—	—	206 T. B.	Callen

17. Problems.—Problems, library research, and reports on mining and metallurgical subjects. *I*; (1).

Prerequisite: Senior standing in mining engineering.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	17	1	—	10	—	—	—	—	—	—	Stock

19. Ore and Coal Preparation.—Principles and machines used in breaking, pulverizing, sizing, classifying, and concentrating ores and mineral products. Wet and dry concentration. Practical limits of ore dressing. Principles applied in coal preparation. Laboratory practise in ore concentration. *I*; (3).

Prerequisite: Chemistry 5; Geology 13a and 13b or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	19	3	—	—	—	10	—	10	—	206 T. B.	Holbrook
			Laboratory 1-4	—	—	—	—	—	—	Min. L.	

21. Examination and Valuation.—The methods of examining, valuing, and reporting on mines, mining and metallurgical plants. Estimation and prospecting of mineral deposits. *I*; (2).

Prerequisite: Mining 3 or 4, or registration in Mining 3; Geology 13a and 13b, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	21	2	—	—	11	—	11	—	—	206 T. B.	Stock

41. Principles of Coal Plant Design.—Design of mine structures of wood, steel, and masonry, with drafting practise in design of coal tipples and general surface plant. *I*; (3).

Prerequisite: Civil Engineering 58, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	41	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

42. Coal Plant Design.—General layout; design; estimates for construction and specifications for coal mining plant. *II*; (2).

Prerequisite: Mining 41.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	42	2	—	9,10	—	9,10	—	—	—	207 T. B.	Holbrook

43. Principles of Ore Plant Design.—Design of mine structures of wood, steel, and masonry, with drafting practise in design of rock houses, ore bins, and crushing plants. *I*; (3).

Prerequisite: Civil Engineering 58, or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	43	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

44. Ore Plant Design.—General layout; design; estimates for construction and specifications for ore mining plants. *II*; (2).

Prerequisite: Mining 43.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	44	2	—	9,10	—	9,10	—	—	—	207 T. B.	Holbrook

45. Principles of Mill and Smelter Design.—Flow sheets and structures of wood, steel, and masonry; drafting practise on individual designs. *I*; (3).

Prerequisite: Civil Engineering 58 or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	45	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

46. Mill and Smelter Design.—Flow sheets; design; estimates for construction, and specifications for concentrating plant or smelter. *II*; (2).

Prerequisite: Mining 45.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	46	2	—	9,10	—	9,10	—	—	—	207 T. B.	Holbrook

42. Mine Surveying.—The application of general surveying methods to mine work; the description and use of instruments employed underground and in connecting surface and underground surveys; the platting and use of mine maps; mineral land surveying; the theory and use of solar attachments; determination of the meridian. A surveying trip is made to neighboring mines, of which the estimated cost is \$10.00. *II*; (3).

Prerequisite: Civil Engineering 35.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	62	3	—	—	—	—	9-12	—	8-12	206 T. B.	Callen

64. Coal Mining Laboratory.—Different coals; their availability for crushing, dry preparation, washing, and briquetting. Complete commercial tests, using small commercial machines wherever possible; design of flow sheets; analysis of products. Estimation of probable costs. *II*; (3).

Prerequisite: Mining 9 or 19.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Min. E.	64	3	—	—	8-12	—	—	—	—	Min. L.	Holbrook
			—	—	1-4	—	—	—	—		

Mining Engineering

66. Ore Concentration Laboratory.—Complete commercial wet and dry concentration tests on raw ores of lead, zinc, iron, etc. Amalgamation and cyanidation of a gold ore. Sampling, preparation, and analysis or assay of the products recovered. *II*; (3).

Prerequisite: Mining 9 or 19.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	66	3	—	—	8-12	—	—	—	—	Min. L.
			—	—	1-4	—	—	—	—	Holbrook

68. Mine Topography.—Stadia; application of topographic and railroad surveying to mining conditions. *II*; (1).

Prerequisite: Civil Engineering 27.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	68	1	—	—	—	—	1,2,3	—	—	207 T. B.
										Callen

90. Mining and Metallurgical Reports.—Review of mining and metallurgical literature; reports; technical writing. *II*; (1).

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	90	1	—	1,2	—	—	—	—	—	206 T. B.
										—

98. Thesis.—Individual investigation of a special mining subject; preparation of thesis giving review of the literature, the results of experimental work, and a general discussion of the subject. *II*; (3).

(Hours arranged when thesis is permitted, in accordance with regulations of the College of Engineering.)

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

Courses for Graduates

Entrance upon graduate work in mining engineering presupposes a full undergraduate course in that subject.

101. Advanced Mining Methods.—Coal and ore fields of the United States; methods and economics of mining; utilization, marketing, storage, and transportation of coal and ores. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK

102. Advanced Preparation of Coal and Ores.—Detailed investigation and discussion of settling ratios; laws of crushing; sorting vs. sizing; specific mill and washing problems. *Twice a week; I, II; (1 unit). Time to be arranged.*

Assistant Professor HOLBROOK

103. The History of Miners' Organizations.—The effect of organizations upon the development of mining practise. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK

104. Mining Reports.—The law of the apex; classification of coal and ore lands; conservation of mineral resources; mine examination and report. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK, Assistant Professor HOLBROOK

105. Welfare Work and Education Among Mine Employees.—The organization and operation of mining institutes, night classes, welfare, mine rescue and first-aid work. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK

MODERN LANGUAGES

(See ENGLISH LANGUAGE AND LITERATURE, GERMANIC LANGUAGES AND LITERATURE, and ROMANCE LANGUAGES AND LITERATURE.)

MUNICIPAL AND SANITARY ENGINEERING

ARTHUR NEWELL TALBOT, C.E., D.Sc., *Professor*

MELVIN LORENIUS ENGER, B.S., C.E., *Assistant Professor, Mechanics and Hydraulics*

HAROLD EATON BABBITT, S.B., *Instructor*

2. Water Supply Engineering.—Source of supply; hydraulics of wells; stream flow; impounding and storage reservoirs; conduits and pipe lines; pumps and pumping machinery; stand-pipes and elevated tanks; the distribution system; tests and standards of purity of potable water. Designing weekly. *I; (4).*

Prerequisite: Theoretical and Applied Mechanics 29, 10; Chemistry 1; Mechanical Engineering 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	2	4	E	8	—	8	—	8	—	208 E. H.	Enger Babbitt
				—	—	1-4	—	—	—	208 E. H.	
			F	11	—	11	1-4	11	—	208 E. H.	
			G	9	—	9	—	9	—	208 E. H.	
				—	—	—	—	1-4	—	208 E. H.	

3. Sewerage.—Design and construction of sewerage systems; sanitary necessity of sewerage; separate and combined water carriage systems; surveys, and general plans; hydraulics of sewers; house sewage and its removal; relation of rainfall to storm water flow; determination of size and capacity of sewers; forms and strength of sewer appurtenances; modern methods of sewage disposal; estimates and specifications. Designing weekly. *II; (3).*

Prerequisite: Theoretical and Applied Mechanics 29, 10; Chemistry 1; Municipal and Sanitary Engineering 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	3	3	E	1-4	9	—	9	—	—	208 E. H.	Babbitt
			F	—	8	—	8	—	8-11	208 E. H.	

6a-6b. Water Purification, Sewage Disposal, and General Sanitation.—Impurities in water supplies and methods and processes of their removal; sewage disposal by filtration, chemical precipitation, irrigation; representative purification plants; garbage collection and disposal; sanitary restrictions and regulations and general sanitation. Lectures; seminar work; drafting. *I; (3); II; (2).*

Prerequisite: Municipal and Sanitary Engineering 2, 3; Chemistry 1, 3, 10b.

Music

FIRST SEMESTER												
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
M. & S. E.	6a	3	—	1	—	—	—	—	8-11	208 E. H.	Talbot Babbitt	
			—	—	—	9-12	—	—	214 E. H.			
SECOND SEMESTER												
	6b	2	—	8	—	—	—	—	—	208 E. H.		
				—	—	1-4	—	—	—	214 E. H.		

9. Hydraulic Design and Construction.—Reservoirs, dams, conduits, and waterways; hydraulic engineering problems. *II; (2).*

Prerequisite: Municipal and Sanitary Engineering 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. & S. E.	9	2	—	—	2,3	—	—	2,3	—	208 E. H.	Enger

98. Thesis.—Investigation or design of an engineering problem. *II; (2).*
Time to be arranged. Professor TALBOT, Mr. BABBITT

99. Inspection Trip.—*I; (no credit).*

Prerequisite: Senior standing.

Courses for Graduates

Entrance upon graduate work in municipal and sanitary engineering presupposes a full undergraduate course in that subject.

102. Water Supply Engineering.—Water supply; general water-works construction; pumps and pumping; design of reservoirs and elevated tanks; water-works operation and the valuation of plants. *One to three times a week; I or II; (1 unit).* *Time to be arranged.* Professor TALBOT

103. Sewerage.—Design and construction; systems; hydraulics of sewers; a study of run-off. *Once or twice a week; II; (1 unit).* *Time to be arranged.* Professor TALBOT

106. Water Purification, Sewage Disposal, and General Sanitation.—The design, construction, and operation of water purification plants and of sewage disposal works; the study of existing plants; comparison of results and cost of construction and operation; experimental work on water filters and septic tanks; garbage disposal; general sanitation. *Once a week; II; (½ unit).* *Time to be arranged.* Professor TALBOT

MUSIC

JOHN LAWRENCE ERB, F.A.G.O., *Director, University Organist*

GEORGE FOSS SCHWARTZ, A.M., MUS.B., *Assistant Professor, Theory and History of Music*

HENRI JACOBUS VAN DEN BERG, *Instructor, Piano*

ALBERT AUSTIN HARDING, *Instructor, Wind Instruments, Director of the Band*

EDNA ALMEDA TREAT, MUS.B., *Instructor, Piano*

EDSON WILFRED MORPHY, *Instructor, Violin*

HEBER DIGNAM NASMYTH, *Instructor, Voice*

FRANK TATHAM JOHNSON, *Instructor, Voice*

MABEL GENEVIEVE WRIGHT, A.B., B.MUS., *Instructor, Piano*

History and Theory

1-2. History of Music.—I, II; (2).*Prerequisite:* One year of university work.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	1	2	—	—	11	—	11	—	—	104 U. H.
				Instructor						
				Schwartz						

SECOND SEMESTER										
Music	2	2	—	Schedule the same as for 1 (first semester).						

3-4. Theory of Music (Harmony).—I, II; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	3	2	A	—	—	11	—	11	—	104 U. H.	} Schwartz
			B	—	—	2	—	2	—	104 U. H.	
			C	—	—	3	—	3	—	104 U. H.	

SECOND SEMESTER										
Music	4	2	—	Schedule the same as for 3 (first semester).						

5-6. Theory of Music (Harmony).—Continuation of 3-4. I, II; (3).*Prerequisite:* Music 3-4.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	5	3	A	2	—	2	—	2	—	104 U. H.	Schwartz
			B	3	—	3	—	3	—	104 U. H.	Schwartz

SECOND SEMESTER										
Music	6	3	—	Sections and schedule the same as for 5 (first semester).						

7-8. Counterpoint, Canon, and Fugue.—I, II; (3).*Prerequisite:* Music 5-6.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Music	7	3	—	11	—	11	—	11	—	104 U. H.	Schwartz

SECOND SEMESTER										
Music	8	3	—	Schedule the same as for 7 (first semester).						

9-10. General Theory and Analysis.—I, II; (2).*Prerequisite:* Music 7-8.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	9	2	—	—	3	—	3	—	—	126 U. H.
				Instructor						
				Erb						

SECOND SEMESTER										
Music	10	2	—	Schedule the same as for 9 (first semester).						

11-12. Acoustics.—I, II; (1).*Prerequisite:* Music 3 to 8 inclusive.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	11	1	—	—	—	—	2	—	—	201 U. H.
				Instructor						
				Erb						

SECOND SEMESTER										
Music	12	1	—	Schedule the same as for 11 (first semester).						

Music

13-14. Constructive Listening (Musical Appreciation).—*I, II; (1).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	13	1	—	—	—	3	—	—	—	126 U. H.
Instructor Erb										

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	14	1	—	—	—	3	—	—	—	126 U. H.
Instructor Erb										

Public School Music

21a-21b. Ear Training, First Year.—Two hours a week; required of all music students. *I, II; (no credit).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	21a	—	—	9	—	9	—	—	—	126 U. H.
Instructor —										

SECOND SEMESTER										
Music	21b	—	—	Schedule the same as for 21a (first semester).						

22a-22b. Ear Training, Second Year.—Two hours a week, required of students in the course in Music in the sophomore year. *I, II; (1).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	22a	1	—	—	9	—	9	—	—	126 U. H.
Instructor —										

SECOND SEMESTER										
Music	22b	1	—	Schedule the same as for 22a (first semester).						

23a-23b. Sight Singing, First Year.—Two hours a week; required of students in the course in Music in the sophomore year. *I, II; (no credit).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	23a	—	—	10	—	10	—	—	—	126 U. H.
Instructor —										

SECOND SEMESTER										
Music	23b	—	—	Schedule the same as for 23a (first semester).						

24a-24b. Sight Singing, Second Year.—Two hours a week; required of students in the course in Music in the junior year. *I, II; (1).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	24a	1	—	—	10	—	10	—	—	126 U. H.
Instructor —										

SECOND SEMESTER										
Music	24b	1	—	Schedule the same as for 24a (first semester).						

25a-25b. Methods of Teaching.—Elements of theory, eye and ear training, the limitations of the child-voice, selection of material, pedagogical presentations, appreciation work for the high school. (Primarily for students preparing to teach music in the public schools.) *I, II; (4).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Music	25a	4	—	2	2	2	2	—	—	126 U. H.
Instructor —										

SECOND SEMESTER										
Music	25b	4	—	Schedule the same as for 25a (first semester).						

27a-27b. Ensemble.—*I, II; (1). Time to be arranged.*

Piano

Mr. VAN DEN BERG, Miss TREAT, Miss WRIGHT

Hours to be arranged.

(In registering for the first semester use the first of the two hyphenated numbers attached to each course, and in registering for the second semester use the second number; for example, register for Music 41a for the first semester, and for Music 41b for the second semester.)

41a-41b. Preparatory Course in Piano, First Year.—I, II. (No collegiate credit).

41c-41d. Preparatory Course in Piano, Second Year.—I, II. (No collegiate credit).

41e-41f. Preparatory Course in Piano, Third Year.—I, II. (No collegiate credit).

42a-42b.—Piano, First Year.—I, II; (4).

43a-43b. Piano, Second Year.—I, II; (4).

44a-44b. Piano, Third Year.—I, II; (4).

45a-45b. Piano, Fourth Year.—I, II; (4).

46a-46b, 46c-46d. Piano, Two Years.—The first two years' work in piano taken as a minor by students majoring in voice or violin. *I, II; (2).*

47a-47b. Piano.—For students from other departments of the university. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).**

Voice

Mr. NASMYTH, Mr. JOHNSON.

Hours to be arranged.

(See note above, under courses in piano.)

51a-51b.—Preparatory Course in Voice, First Year.—I, II; (no collegiate credit).

51c-51d. Preparatory Course in Voice, Second Year.—I, II; (no collegiate credit).

51e-51f. Preparatory Course in Voice, Third Year.—I, II; (no collegiate credit).

52a-52b. Voice, First Year.—I, II; (4).

53a-53b. Voice, Second Year.—I, II; (4).

54a-54b. Voice, Third Year.—I, II; (4).

55a-55b. Voice, Fourth Year.—I, II; (4).

*See page 22.

Music

56a-56b, 56c-56d. Voice, Two Years.—The first two years' work in voice taken as a minor by students majoring in piano or violin. *I, II; (2).*

57a-57b. Voice.—For students from other departments of the University. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).**

Violin

Mr. MORPHY

Hours to be arranged.

(See note under courses in piano.)

61a-61b. Preparatory Course in Violin, First Year.—*I, II; (no collegiate credit).*

61c-61d. Preparatory Course in Violin, Second Year.—*I, II; (no collegiate credit).*

61e-61f.—Preparatory Course in Violin, Third Year.—*I, II; (no collegiate credit).*

62a-62b. Violin, First Year.—*I, II; (4).*

63a-63b. Violin, Second Year.—*I, II; (4).*

64a-64b. Violin, Third Year.—*I, II; (4).*

65a-65b. Violin, Fourth Year.—*I, II; (4).*

66a-66b, 66c-66d. Violin, Two Years.—The first two years' work in violin taken as a minor by students majoring in piano or voice. *I, II; (2).*

67a-67b. Violin.—For students from other departments of the University. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).**

Violoncello

Mr. SCHWARTZ

Hours to be arranged.

(See note above, under courses in piano.)

71a-71b. Preparatory Course in Violoncello, First Year.—*I, II; (no collegiate credit).*

71c-71d. Preparatory Course in Violoncello, Second Year.—*I, II; (no collegiate credit).*

71e-71f. Preparatory Course in Violoncello, Third Year.—*I, II; (no collegiate credit).*

72a-72b.—Violoncello, First Year.—*I, II; (4).*

73a-73b. Violoncello, Second Year.—*I, II; (4).*

74a-74b. Violoncello, Third Year.—*I, II; (4).*

75a-75b. Violoncello, Fourth Year.—*I, II; (4).*

*See page 22.

76a-76b, 76c-76d. Violoncello, Two Years.—The first two years' work in violoncello taken as a minor by students majoring in piano, voice, or violin. *I, II; (2).*

77a-77b. Violoncello.—For students from other departments of the University. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).**

Organ

Director **ERB**

Hours to be arranged.

Students desiring to take organ will be obliged to pass without conditions the entrance examination in piano. Under no circumstances will they be accepted if their piano work falls below the standard represented by this examination.

81-82. Organ, First Year.—*I, II; (4).*

84-85. Organ, Second Year.—*I, II; (4).*

86-87. Organ, Third Year.—*I, II; (4).*

88-89. Organ, Fourth Year.—*I, II; (4).*

83a-83b, 83c-83d. Organ, Two Years.—First two years' work in organ taken as a minor by students majoring in piano, voice, or violin. *I, II; (2).*

**Band, Orchestra and Ensemble Work

92a-92b.—Band Instruments.—*I, II; (no credit). Time to be arranged.*

94a-94b. Recital Course in Practical Music.—(For seniors in Music 45a-45b, 55a-55b, 65a-65b, 88-89.) *I, II; (1). Time to be arranged.*

96a-96b. Band Instrumentation.—*I, II; (no credit). Time to be arranged.*

97a-97b. Band Arranging.—*I, II; (no credit). Time to be arranged.*

PALEONTOLOGY

(See GEOLOGY 1a, 16, 18, 19, 20, 21.)

PHILOLOGY

(See CLASSICS, ENGLISH LANGUAGE AND LITERATURE, GERMANIC LANGUAGES AND LITERATURE, and ROMANCE LANGUAGES AND LITERATURE.)

PHILOSOPHY

(See also PSYCHOLOGY and EDUCATION.)

ARTHUR HILL DANIELS, PH.D., *Professor*

BOYD HENRY BODE, PH.D., *Professor*

QUEEN LOIS SHEPHERD, PH.D., *Instructor*

CARL HERMAN HAESSLER, A.B., *Assistant*

*See page 22.

**For information concerning registration in the University bands, see the Director of the Band, 217 U. H., or Director of the School of Music, 201 U. H.

Philosophy

Major: Twenty hours from any courses offered by the department, including Philosophy 1, 2, 3, and 4, and one other advanced course. Six hours in psychology may be counted toward a major in philosophy.

Minors: Twenty hours in (a) psychology (at least six additional hours, if psychology is counted toward a major), and one other subject in the following list; or (b) any two subjects in the same group in the following list: (A) economics, history, political science, education, sociology; (B) English, French, German, Greek, Latin; (C) botany, chemistry, mathematics, physics, zoology. No course in any subject of the above groups may be counted for the minor requirement if it is excluded from the major requirement of its respective department.

Courses for Undergraduates

1. Logic.—The principles of reasoning; detection of fallacies; evidence. *I* or *II*; (3).

Prerequisite: One year of university work.

FIRST SEMESTER												
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Philosophy	1	3	A, Lecture	1	—	1	—	—	—	228 N. H.	} Bode Shepherd Haessler	
			A, Quiz	—	—	—	—	1	—	—		
			(Other hours to be arranged)									
			B, Lecture	10	—	10	—	—	—	—		
			B, Quiz	—	—	—	—	10	—	—		
(Other hours to be arranged)												
SECOND SEMESTER												
			Lecture	2	—	2	—	—	—	100 Com.	} Bode Shepherd Haessler	
			Quiz	—	—	—	—	2	—	—		
(Other hours to be arranged)												

2. Introduction to Philosophy.—Philosophic problems in their relation to the doctrine of evolution and in their bearing on conduct and religion. *II*; (3).

Prerequisite: Two years of university work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	2	3	—	1	—	1	—	1	—	228 N. H.	Bode Shepherd

9. Political and Social Ethics.—Moral principles applied to political and social relations. *I*; (3).

Prerequisite: Two years of university work.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	9	3	Lecture	10	—	10	—	—	—	202 L. H.	Daniels Haessler
			Quiz	—	—	—	—	10	—	202 L. H.	

Courses for Advanced Undergraduates and Graduates

3. History of Ancient and Medieval Philosophy.—*I*; (3).

Prerequisite: Three hours in philosophy; junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	3	3	—	11	—	11	—	11	—	113 L. H.	Daniels

4. History of Modern Philosophy.—From the Renaissance to the present time. *II*; (3).

Prerequisite: Three hours in philosophy; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	4	3	—	3	—	3	—	3	—	117 L. H.	Shepherd

7. Ethics.—The beginnings and growth of morality; the fundamental questions of ethical theory; social and economic problems of the present. *II*; (3).

Prerequisite: Three hours in philosophy; senior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	7	3	—	11	—	11	—	11	—	117 L. H.	Daniels

11. Philosophy of Religion.—The philosophical interpretation of religious consciousness. Topics: God, revelation, inspiration, dogma, prayer, faith, immortality, the problem of evil; the relation of morality and religion. *II*; (2).

Prerequisite: Senior or graduate standing; six hours in psychology or philosophy, or in both.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	11	2	—	—	11	—	11	—	—	117 L. H.	Daniels

15. British Philosophers of the Eighteenth Century.—Locke, Berkeley, and Hume. *I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	15	3	—	—	—	—	—	—	—	113 L. H.	Bode

(Arrange)

16. Philosophy of Pragmatism.—*II*; (3).

Prerequisite: Philosophy 15.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	16	3	—	—	—	—	—	—	—	113 L. H.	Bode

(Arrange)

18. Philosophers of the Nineteenth Century.—Philosophical tendencies in materialism, naturalism, idealism, and pragmatism. *I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	18	3	—	—	—	—	—	—	—	113 L. H.	Shepherd

(Arrange)

19. Rationalism and Religion in the Eighteenth and Nineteenth Centuries.—*I*; (3).

Prerequisite: Philosophy 2 or 3 or 4; junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	19	3	—	—	—	—	—	—	—	113 L. H.	Shepherd

(Arrange)

Physical Training

Courses for Graduates

Students entering upon graduate work in philosophy must have had a thoro course in the history of philosophy, a course in logic, and a general course in psychology.

103. Seminar in Ethics.—British ethics from Hobbes to Sidgwick. *Twice a week; I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	103	1 unit	—							107 L. H.	Daniels
(Arrange)											

107a-107b-107c. History of Philosophy.—a: Plato and Aristotle. *Twice a week; (1 unit).* b: Descartes, Spinoza, and Leibnitz. *Twice a week; (1 unit).* c: Kant and Schopenhauer. *Twice a week. (1 unit); I, II.* The subject for 1916-17 is 107a.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	107a	1 unit	—							107 L. H.	Daniels
(Arrange)											

108a-108b-108c. Seminar in Contemporary Philosophy.—a: idealism. *Twice a week; (1 unit).* b: Realism and pragmatism. *Twice a week; (1 unit).* c: The philosophy of Bergson. *Twice a week; (1 unit).* I, II. The subject for 1916-17 is 108b.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Philosophy	108b	1 unit	—							107 L. H.	Bode
(Arrange)											

PHOTOGRAPHY

ARTHUR GRENVILLE ELDRIDGE, *Instructor*

1-2. The Principles and Practise of Photography.—For advanced students who use photography in connection with their special subjects. Lenses, cameras; plates and films; exposure; development; printing; copying; positives; landscape, architectural, and scientific photography; speed work; color photography. Lectures and demonstrations; each student is required to produce a stated amount of work covering the processes treated. *I, II; (one hour a week, no credit).*

Prerequisite: Junior standing and the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Photography	1	—	—	—	2-5	—	—	—	—	404 P. L.	Eldredge
(Other hours to be arranged)											

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Photography	2	—	—	Schedule the same as for 1 (first semester).							

PHYSICAL TRAINING FOR MEN

GEORGE A HUFF, *Director*

HARRY LOVERING GILL, *Associate, Track*

RALPH R JONES, *Associate, Basket Ball*

ROBERT CARL ZUPPKE, A.B., *Associate, Football*

ROY. NEWTON FARGO, B.S., *Director of the Men's Gymnasium*

EDWARD JOHN MANLEY, *Instructor, Swimming*
 WALTER EVANS, *Assistant*
 ALVIN ROMEISER, *Assistant*
 SAMUEL BILIK, *Assistant*

1-2. Gymnasium Practise.—Two hours' gymnasium drill each week. (Required of freshmen. First semester given in conjunction with 1a below.) Begins Monday, September 25, I; ($\frac{1}{2}$): II; (1).

NOTE.—(a) Freshmen should register in both 1 and 1a the first semester, and must report to both 1 and 1a one hour per week until lectures are completed, after which they must report two hours per week for 1. During the first six weeks the sections in 1 will be held the first hour during the week called for on the schedule, except section H, which will be held the second hour during the week.

(b) Students registered in course 1 must supply themselves with proper gymnasium attire during registration week. Information regarding gymnasium suits may be obtained at the men's gymnasium.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
P. T.	1	$\frac{1}{2}$	A	10	—	—	—	10	—	Gym.
			B	11	—	—	—	11	—	
			C	—	—	2	—	2	—	
			D	—	—	3	—	3	—	
			E	—	10	—	10	—	—	
			F	—	11	—	11	—	—	
			G	—	2	—	2	—	—	
			H	—	3	—	3	—	—	
										Instructor
										Fargo

SECOND SEMESTER										
P. T.	2	1	—	Schedule and sections the same as for 1 (first semester).						

NOTE.—All freshmen must be able to swim fifty yards before receiving credit in P. T. 2.

1a. Personal Hygiene.—Six lectures by the Dean of Men. Required in conjunction with Physical Training 1. These lectures begin Monday, September 25, 1916. I; (*first six weeks*).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
P. T.	1a	$\frac{1}{2}$	A	—	—	—	—	11	—	100 Com.
			B	—	—	—	11	—	—	204 Com.
			C	4	—	—	—	—	—	100 Com.
			D	—	3	—	—	—	—	100 Com.
			E	—	—	4	—	—	—	100 Com.
			F	—	—	—	4	—	—	100 Com.
			G	—	—	—	—	4	—	100 Com.
										Instructor
										Clark

3-4. Heavy Apparatus Work.—I, II; (1).

Prerequisite: Physical Training 1-2.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
P. T.	3	1	—	4	—	4	—	4	—	Gym.
										Instructor
										Fargo
SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
P. T.	4	1	—	Schedule the same as for 3 (first semester).						

Physical Training

PHYSICAL TRAINING FOR WOMEN

LOUISE FREER, A.B., B.S., *Director*

VERNA BROOKS, A.B., *Instructor*

ANNA LUE HUGHITT, *Instructor*

EDITH GRIFFITH OSMOND, A.B., B.S., *Instructor*

CAROLINE RUTH MORRIS, A.B., *Assistant*

ROSA-LEE GAUT, MUS.B., *Assistant*

7a-7b. Practise.—Class work consisting of light gymnastics, gymnastic dancing, games, personal hygiene, and corrective work. Required of freshmen. *I, II; (1).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	7a	1	A	—	9	—	9	—	9	W. B.	<div>Freer</div> <div>Hughitt</div> <div>Brooks</div> <div>Osmond</div> <div>Morris</div>

SECOND SEMESTER

P. T. 7b 1 — Sections and schedule the same as for 7a (first semester).

8a-8b. Practise.—(Continuation of 7a-7b. Second year, elective.) *I, II; (1).*

Prerequisite: Physical Training 7a-7b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	8a	1	A	—	9	—	9	—	9	W. B.	<div>Brooks</div> <div>Hughitt</div> <div>Osmond</div>
			B	10	—	10	—	10	—	W. B.	
			C	3	—	3	—	3	—	W. B.	
			D	4	4	4	—	—	—	W. B.	

SECOND SEMESTER

P. T. 8b 1 — Sections and schedule the same as for 8a (first semester).

9. Hygiene.—Required of freshmen. *I; (1).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	9	1	—	4	—	—	—	—	—	—	—

10a. Teachers' Course.—Third year. Theory of play; development of the child through play; playground management; folk dances, singing games and games of skill. Theory, one hour; lectures, reports, outside reading. Practise teaching in the gymnasium and in the public schools. *I; (1).*

Prerequisite: Physical Training 7a-7b; 8a-8b, and 9; Psychology 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	10a	1	—	—	—	—	—	—	10-12	W. B.	Osmond

10b. Teachers' Course.—(Continuation of 10a.) Theory and practise of gymnastic teaching. The school festival. *II; (1).*

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	10b	1	—	—	—	—	—	—	10-12	W. B.	Osmond

11a-11b. Teachers' Course.—Fourth year. A. Anthropometry, massage, corrective gymnastics. B. First Aid. *I, II*; (no credit). *Time to be arranged.* Miss HUGHITT

Prerequisite: Physical Training 10a-10b.

PHYSICS

ALBERT PRUDEN CARMAN, D.Sc., *Professor*
 CHARLES TOBIAS KNIPP, Ph.D., *Associate Professor*
 FLOYD ROWE WATSON, Ph.D., *Associate Professor*
 JAKOB KUNZ, Ph.D., *Associate Professor, Mathematical Physics*
 WILLIAM FREDERICK SCHULZ, Ph.D., *Assistant Professor*
 ELMER HOWARD WILLIAMS, Ph.D., *Associate*
 WILLIAM HENRY HYSLOP, A.M., *Assistant*
 EARLE HORACE WARNER, A.M., *Assistant*
 PAUL LEVERN BAYLEY, A.M., *Assistant*
 CHARLES FRANCIS HILL, A.M., *Assistant*
 WALTER ANDREW SHEWHART, A.M., *Assistant*
 CHARLES STEVER FAZEL, A.M., *Assistant*
 HARRY TYLER BOOTH, M.S., *Assistant*
 CARL ELI PIKE, B.S., *Assistant*
 ROY ANDREW NELSON, B.S., *Assistant*
 LAURENCE ELMER VOORHEES, A.B., *Assistant*

Physics 7a-7b and 8a-8b are recommended to students not specializing in mathematics, chemistry, or engineering. For undergraduate students taking advanced work or a major in physics, the following outline of work is suggested:

Freshman year: Trigonometry (Math. 4) and Chemistry.

Sophomore year: Physics 1a-1b, 3a-3b, or Physics 7a-7b, 8a-8b.

Junior year: Physics 15, 16, 17, 23, or 24.

Senior year: Physics 4a-4b, 14a-14b, 20, 22, 25, 30, or 31.

Introductory Courses for Undergraduates

1a-1b. General Physics.—Lectures with class-room demonstration; recitations; written exercises. (For sophomores in engineering, mathematics, physics, and chemistry.) *I*; (3); *II*; (2).

Prerequisite: Registration in Physics 3a-3b; freshman mathematics.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	1a	3	Lecture I	9	—	9	—	—	—	100 P. L.	Carman
			Lecture II	11	—	11	—	—	—	100 P. L.	Carman
			Quiz								
			C	—	—	—	—	11	—		
			D	—	—	—	—	11	—		
			E	—	—	—	—	11	—	104 P. L.	Carman
			F	—	—	—	—	9	—	108 P. L.	Schulz
			G	—	—	—	—	9	—	302 P. L.	Hyslop
			K	—	—	—	—	9	—	305 P. L.	Warner
			L	—	—	—	—	9	—	306 P. L.	Bayley
			M	—	—	—	—	11	—	403 P. L.	Fazel
			N	—	—	—	—	11	—	406 P. L.	Booth
			O	—	—	—	—	9	—		
			P	—	—	—	—	9	—		
			Q	—	—	—	—	11	—		

SECOND SEMESTER

Physics 1b 2 — Sections and schedule the same as for 1a (first semester).

Physics

3a-3b. Physical Measurements.—Laboratory experiments; quizzes in connection with Physics 1a-1b. *I, II; (2).*

Prerequisite: Physics 1a-1b, or registration therein.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	3a	2	C	—	10,11	—	10,11	—	—	305 P. L. 312 P. L. 403 P. L. 406 P. L.	Schulz Hyslop Warner Bayley Fazel Booth
			D	—	10,11	—	10,11	—	—		
			E	—	8,9	—	8,9	—	—		
			F	2,3	—	—	—	2,3	—		
			G	—	2,3	—	2,3	—	—		
			K	10,11	—	10,11	—	—	—		
			L	10,11	—	10,11	—	—	—		
			M	2,3	—	—	—	2,3	—		
			N	2,3	—	—	—	2,3	—		
			O	—	—	2,3	—	—	10,11		
			P	—	8,9	—	8,9	—	—		
			Q	—	10,11	—	10,11	—	—		
			X	—	2,3	—	2,3	—	—		

SECOND SEMESTER

Physics 3b 2 — Sections and schedule the same as for 3a (first semester).

7a-7b. General Physics.—Lectures; class-room demonstrations; recitations. (For students in arts and science.) *I, II; (2½).*

Prerequisite: Mathematics 4, or registration therein; registration in Physics 8a-8b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	7a	2½	Lecture	—	11	—	11	—	—	119 P. L.	Watson
			A, Quiz	—	—	—	—	9	—	208 P. L.	Williams
			B, Quiz	—	—	—	—	10	—	208 P. L.	Shewhart
			*C, Quiz	—	—	8	—	8	—	302 P. L.	Pike
			*D, Quiz	8	—	—	—	8	—	208 P. L.	Nelson

SECOND SEMESTER

Physics 8b 2½ — Sections and schedule the same as for 7a (first semester).

8a-8b. Introductory Laboratory Physics.—Physical measurements. *I, II; (2½).*

Prerequisite: Registration in Physics 7a-7b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	8a	2½	A	10,11	—	10,11	—	—	—	212 P. L.	Williams Shewhart Pike
			B	2,3	—	2,3	—	—	—	212 P. L.	
			*C	8,9	—	—	—	—	—	212 P. L.	
			*D	—	—	8,9	—	—	—	212 P. L.	

SECOND SEMESTER

Physics 8b 2½ — Sections and schedule the same as for 8a (first semester).

9a-9b. General Physics.—Lectures; class-room demonstrations; recitations. (For students in architecture.) *I, II; (2).*

Prerequisite: Mathematics 4; registration in Physics 10a-10b.

*Sections C and D are reserved for agricultural students.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	9a	2	Lecture	—	11	—	11	—	—	119 P. L.	Watson
			A, Quiz	—	—	—	—	9	—	119 P. L.	Williams
			B, Quiz	—	—	—	—	11	—	208 P. L.	Shewhart Pike Nelson

SECOND SEMESTER										
Physics	9b	2	—	Sections and schedule the same as for 9a (first semester).						

10a-10b. Introductory Laboratory Physics.—Physical measurements. I, II; (2).

Prerequisite: Registration in Physics 9a-9b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	10a	2	A	8,9	—	8,9	—	—	—	212 P. L.	Williams
			B	—	8,9	—	8,9	—	—	119, 308 P. L.	Shewhart Pike

SECOND SEMESTER										
Physics	10b	2	—	Sections and schedule the same as for 10a (first semester).						

Intermediate Courses

15. Electricity and Magnetism.—Recommended to students in non-technical courses who wish a knowledge of electricity and magnetism beyond the course in general physics. Two recitations or lectures and one three-hour laboratory exercise weekly. Brooks and Poyser: *Electricity and Magnetism*. I; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	15	3	—	9	—	9	—	1-4	—	112, 208 P. L.	Knipp

16. Heat.—Fundamental heat phenomena, the mechanical theory of heat and elementary thermodynamics. Laboratory experiments in thermometry, calorimetry, vapor pressure, expansion of bodies, transmission of heat, and mechanical equivalent. I; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	16	3	—	—	9	—	9	—	9-12	208, 213 P. L.	Watson Nelson

17. Light.—Reflection, refraction, interference, diffraction, and polarization; the theory and use of optical instruments; lectures and laboratory. For students in general physics, but also adapted to those who wish to learn the use of the refractometer, telescope, microscope, polarising microscope, polarimeter, saccharimeter, spectrometer and interferometer. Houstoun: *Treatise on Practical Light*. II; (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	17	3	—	2	—	2	—	2-5	—	301 P. L. 303 P. L.	Schulz Schulz

Physics

[18. **Teachers' Course.**—Discussion of text-books, reference books, laboratory manuals, apparatus ordering, and methods of conducting work in physics. Manipulative work with glass and apparatus. Discussion of selected topics in advanced general physics. *II*; (3). Not given in 1916-17.

Prerequisite: A course in general physics, or experience in teaching.]

[23. **Sound.**—The phenomena of sound, its origin, propagation, velocity, interference, and diffraction; the vibrations of strings and organ pipes and the physical theory of music and speech. Lectures, recitations, laboratory. *II*; (3). Not given in 1916-17.

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.]

24. **Properties of Matter.**—Weight, mass, gravitation, elasticity, viscosity, surface tension, and diffusion. Lectures; recitations; laboratory measurements including the use of the dividing engine, chronograph, etc. Poynting and Thomson: *Properties of Matter*; Watson: *Text-book of Practical Physics*. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	24	3	—	—	10	—	10	—	9-12	208 P. L.	Williams
										313 P. L.	Williams

Courses for Undergraduates and Graduates

4a-4b. **Electrical and Magnetic Measurements.**—Exact electrical and magnetic measurements with accompanying theory. First semester: the more refined and special methods of measuring very high and very low resistances; galvanometers both aperiodic and ballistic; the measurement of electric currents and quantity; the comparison of capacities. A special section is reserved for students of chemistry, including a course of experiments on the measurement of electrolytic resistance, the use of the Dolezalek electrometer, of thermo-couples, and of platinum resistance thermometers for measuring temperatures; the determination of the dielectric constants of solids and liquids; and special uses of the potentiometer. Second semester: the absolute determination of capacity; the determination of the damping factor of a ballistic galvanometer; circuits containing resistance and self-induction; classical methods for the measurement of self and mutual induction; the magnetic properties of iron; plotting of curves and determination of hysteresis losses. Work with various types of potentiometers. *I, II*; (2).

Prerequisite: Physics 1a-1b, 3a-3b, or 7a-7b, 8a-8b; Mathematics 7, 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	4a	2	K	1-4	—	—	—	—	8-11	112 P. L.	<div style="display: inline-block; vertical-align: middle;"> Knipp Hill Voorhees </div>
			L	—	1-4	—	1-4	—	—	112 P. L.	
			M	9-12	—	—	—	9-12	—	112 P. L.	
			N	—	—	1-4	—	1-4	—	112 P. L.	

Special section for chemical students (arrange time).

SECOND SEMESTER

Physics	4b	2	—	Sections and schedule the same as for 4a (first semester).							
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14a. Introduction to Theoretical Physics.—Dynamics. First course in theoretical physics, intended to put in systematic form the fundamental facts and concepts of motion, mass, and force, with problems from pure and applied physics. For the student of general science as well as for students of physics and mathematics. Recitations; problems; lectures. Jean: *Theoretical Mechanics*. I; (3).

Prerequisite: Physics 1a-1b, 3a-3b, or 7a-7b, 8a-8b; Mathematics 8 or 7 and 9.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	14a	3	—	—	8	—	8	—	8	208 P. L.	Carman

20. Light.—Special phenomena; modern theories; readings in texts of Drude, Wood, and Preston. Lectures; recitations. I; (2).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b; Mathematics 7 and 9, or 8.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	20	2	—	4	—	—	—	4	—	301 P. L.	Schulz

22. Light-Photometry.—The scientific principles and methods of photometry; comparison of light sources with standards; determination of reflective power and transmission coefficients; spectrophotometry. Lectures; recitations; laboratory. I; *(2 to 5).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	22	*2 to 5	—	—	2,3	—	2-5	—	—	801, 401 P. L.	Schulz

25. Heat.—Advanced laboratory work in heat; the theory and methods of measurement of temperatures by thermocouples, resistance thermometers, and optical pyrometers. II; (2).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b; Physics 16 advised.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	25	2	—	—	9	—	9	—	9-12	306 P. L.	Watson Nelson

26. Architectural Acoustics.—Acoustics of auditoriums; the common acoustical defects and their cures; the transmission of sound through materials; acoustical properties of building materials. Lectures; problems. (For eight weeks only.) II; (1).

Prerequisite: Physics 1a-1b, 3a-3b; or 9a-9b, 10a-10b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	26	1	—	10	—	10	—	—	—	119 P. L.	Watson

*In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Physics

30. Introduction to Theoretical Electricity.—Electrical and magnetic phenomena discussed with calculus methods. Magnetism, electrostatics, electrolysis, thermo-electricity, electromagnetics, varying currents, alternating currents, units, electromagnetic radiation, conduction through gases, radio-activity and electrons. (For advanced students in physics, chemistry, mathematics, and engineering.) Lectures; recitations; demonstrations. Starling: *Electricity and Magnetism*. II; (3).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	30	3	—	—	9	—	9	—	9	104 P. L.	Knipp

31a-31b. Special Problems in Advanced Physical Measurements.—I, II; *(2 or 3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	31a	*2 or 3	—	(Arrange)							
SECOND SEMESTER											
Physics	31b	*2 or 3	—	(Arrange)							Carman Knipp Watson Schulz Williams

Courses for Graduates

The prerequisite for graduate work in physics is a college course in general physics with a year's laboratory course in introductory physical measurements. The student who is to do major work in physics should also have had additional courses in physics or teaching experience, unless the training in his minor subjects, mathematics or chemistry, has been strong and complete. He should also have a knowledge of French and German sufficient to use references in these languages. The courses named below are those open for candidates for the Master's or Doctor's degree. A large part of the last year's work of the candidate for the Doctor's degree is investigational in either experimental or theoretical physics. In addition to these major graduate courses, the courses in elementary dynamics, heat, light, electrical measurements, and introductory electrical theory, are arranged with certain additions for graduate credit. The "intermediate" courses on heat, light, and electricity and magnetism (Physics 15, 16, 17, 24), may be offered by students making a minor in physics, and with certain limitations by students in their first year of graduate work for major credit.

[121. Recent Advances in Physics and the Electron Theory.—A series of lectures of a non-mathematical character describing the more recent discoveries in physics. The molecular and atomic structure of matter; the universal occurrence of electrons; determination of the e/m and v of the electron and of the ion; determination of the elementary charge of the electron by means of the fog method, by Brownian movement, by radio-activity. *Three times a week; II; ($\frac{1}{2}$ unit).* Not given in 1916-17.

Associate Professor KNIPP, Associate Professor KUNZ

123. Sound.—Wave motion; forced vibrations; the velocity and energy relations of sound waves; resonance; vibrations of strings and organ pipes. *Three times a week; II; (1 unit).*

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	123	1 unit	—	11	—	11	—	11	—	—	Watson

(or arrange)

124. Conduction of Electricity Through Gases.—The classical experiments relating to discharge phenomena. In the second semester an original problem is assigned. Laboratory, collateral reading; discussion. *Three times a week; I, II; (1 to 2 units). Time to be arranged.*

Associate Professor KNIPP

126. Physics Colloquium.—Weekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems in physics. Attendance is expected of all graduate students. *Once a week; I, II; (no credit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	126	—	—	—	—	—	6:45	—	—	—	—

8:00 P. M.

127a. Electron Theory.—(Mathematical part, Seminar.) Theory of radiation of the black body; entropy and probability; the energy quantum and its applications in the theory of the specific heat; the photoelectric and related effects. Topics are selected in advance. *Once in two weeks; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	127a	1 unit	—	—	4	—	—	4	—	306 P. L.	Kunz

(or arrange)

127b. Electron Theory.—(Physical part, Seminar.) The method of physical intuition is used, avoiding deeper mathematical analysis. The Zeeman and corresponding electric phenomena; electro and magneto-optics; emission and absorption spectra; dispersion; photoelectricity; phosphorescence; chemical action of light and electrons; electron theory of metals and of magnetism; constitution of the atom. Of special interest to students in chemistry and general science. *Twice a week; II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	127b	1	—	—	—	—	4,5	—	—	306 P. L.	Kunz

(or arrange)

Schulz

131. Investigation of Special Problems.—Advanced laboratory or design and calculation. A problem worked out with the advice and direction of the instructor. *Two to four times a week; I, II; (1 to 2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	131	1 to 2 units	—	(Arrange)						}	Carman
											Knipp
											Watson
											Kunz
											Schulz

Williams

Physiology

132. Mathematical Physics.—Special phases in theoretical physics.

[(a). **Dynamics.**—Newton's equations, general methods of integration, potential-theory, potential of the ellipsoid, application to celestial mechanics, the principles of least constraint, of virtual work, of D'Alembert, of Hamilton; special problems of hydrodynamics and of electricity. *Three times a week; I, II; (2 units).* Not given in 1916-17.]

(b). **Electrodynamics.**—The potential theory applied to electrical and magnetic polarization; spherical harmonics; images and inversion; conjugate functions; elliptic coordinates and integrals; magnetic actions of currents; determination of coefficients of capacity; self and mutual induction; absolute measurements; Maxwell's theory with some applications in optics. Lectures; collateral reading. *Four times a week; I, II; (2 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	132b	2 units	—	10	—	10	10	10	—	306 P. L.	Kunz

(or arrange)

[(c). **Thermodynamics and Kinetic Theory of Matter.**—The two fundamental principles developed and applied to various physical and chemical phenomena; the theory of chemical equilibrium; the Nernst theorem; the direct method of Carnot's cycle together with the method of the thermodynamic potentials and the derived functions; Maxwell's theory of the distribution of velocities in a gas; Boltzman's H theory; the theory of radiation; Planck's theory of quanta. *I, II; (1 to 2 units).* Not given in 1916-17.

Associate Professor KUNZ]

(d). **Elasticity and Hydrodynamics.**—Problems of elasticity and hydrodynamics of technical interest. Advanced mathematics, but not advanced dynamics, is required. The current literature of physical and technical journals is used. *Twice a week; I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	132d	1 unit	—	—	11	—	11	—	—	306 P. L.	Kunz

(or arrange)

133. Seminar.—*Three or five times a week; I, II; (1 to 3 units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	133	1 to 3 units	—	(Arrange)							Carman Knipp Watson Kunz Schulz

PHYSIOLOGY

WILLIAM EDWARD BURGE, Ph.D., *Assistant Professor*

Major: 20 hours made up from any courses offered in the department, exclusive of Physiology 4.

Minors: 20 hours in bacteriology, botany, chemistry, and zoology.

1. Histology.—A microscopic study of the fundamental mammalian tissues. Continued in Physiology 8. *I; (3).*

Prerequisite: Two years of university work, including five hours in botany or zoology.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	1	3	Lecture	—	—	—	—	8	—	415 N. H.	Burge
			Laboratory	—	8,9	—	8,9	—	—	415 N. H.	—

2. Experimental Physiology.—Nerve and muscle, circulation, respiration, secretion, digestion, and metabolism. Lectures; laboratory. *II*; (5).

Prerequisite: Two years of university work; Physiology 4 and 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	2	5	Lecture	4	—	4	—	—	—	413 N. H.	Burge
			—	—	10,11	—	10,11	—	10,11	413 N. H.	—

4. General Physiology, Chemical and Experimental.—Lectures; demonstrations; recitations; laboratory work. *I* or *II*; (5).

Prerequisite: One semester of university work, including five hours in botany or zoology and five hours in chemistry.

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	4	5	Lecture	—	9	—	—	—	9	228 N. H.	Burge
			A, Laboratory	—	—	8,9	—	8,9	—	413 N. H.	
			B, Laboratory	—	—	1,2	—	1,2	—	413 N. H.	
			Quiz	—	—	—	8	—	—	228 N. H.	

5. Physiology of Nutrition.—Utilization of food material by the body in health under various conditions and in disease. Lectures; demonstrations. *II*; (2).

Prerequisite: Physiology 4.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	5	2	Lecture	—	4	—	4	—	—	415 N. H.	Burge

6. Physiology of the Nervous System.—The functions of the principal motor and sensory tracts of the mammal. *I*; (3).

Prerequisite: Physiology 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	6	3	Lecture	9	—	—	—	—	—	415 N. H.	Burge
			Laboratory	—	10,11	—	10,11	—	—	413 N. H.	—

7. Investigation.—*II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	7	2	—	—	—	—	—	—	—	415 N. H.	Burge

8. Histology.—Microscopic anatomy of the organs. Lectures; laboratory. *II*; (3).

Prerequisite: Two years of university work, including Physiology 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physiology	8	3	Lecture	3	—	—	—	—	—	415 N. H.	Burge
			Laboratory	—	8,9	—	8,9	—	—	413 N. H.	—

Political Science

Courses for Graduates

101. Journal Club.—Review of literature, and discussion of investigations carried on in the department. *Once a week; I, II. Time to be arranged.*
Members of the department

103. Research.—*Three times a week; I, II; (1 to 2 units). Time to be arranged.*
Assistant Professor BURGE

POLITICAL SCIENCE

(See also ECONOMICS, HISTORY, and SOCIOLOGY.)

JAMES WILFORD GARNER, PH.D., *Professor*

JOHN ARCHIBALD FAIRLIE, PH.D., *Professor*

JOHN MABRY MATHEWS, PH.D., *Assistant Professor*

RUSSELL McCULLOCH STORY, A.M., *Instructor*

ROBERT EUGENE CUSHMAN, A.M., *Instructor*

Major: Twenty hours from any courses offered by the department. A major may include three hours of constitutional history (History 4 and 14).

Minors: Twenty hours, selected from two of the following subjects: history, economics, law, sociology, philosophy, and education.

Courses for Undergraduates

NOTE.—Courses 1 and 3 give a survey of national, state, and local government in the United States, and should be taken by students specializing in political science. Course 1a is open only to students in the Colleges of Engineering and Agriculture who desire an introductory course in American Government.

1. American National Government.—Historical development, organization, powers, limitations, and practical working of the national government of the United States. *I; (3).*

Prerequisite: Thirty hours of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science 1	3		I, Lecture	10	—	10	—	—	—	228 N. H.	Mathews
			A, Quiz	—	—	—	9	—	—	—	Story
			B, Quiz	—	—	—	11	—	—	—	Mathews
			C, Quiz	—	—	—	—	9	—	—	Mathews
			D, Quiz	—	—	—	—	10	—	—	Mathews
			II, Lecture	2	—	2	—	—	—	228 N. H.	Garner
			E, Quiz	—	—	—	1	—	—	—	Cushman
			F, Quiz	—	—	—	2	—	—	—	Cushman
			G, Quiz	—	—	—	—	1	—	—	Cushman
			H, Quiz	—	—	—	—	2	—	—	Garner
			I, Quiz	—	—	—	—	2	—	—	Cushman

3. State and Local Government.—Powers, obligations, and rights of the states in the Federal Union; formation and admission of states; development of state constitutions; organization of state and local government; political methods. (A continuation of course 1; may be taken independently.) *II; (3).*

Prerequisite: Thirty hours of university work.

NOTE.—Students may not take both 3 and 16 for more than a total of four hours' credit without special permission of the department.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 3	3		1, Lecture	10	—	10	—	—	—	228 N. H.	Mathews
			A, Quiz	—	—	—	9	—	—	—	Story
			B, Quiz	—	—	—	10	—	—	—	Story
			C, Quiz	—	—	—	—	9	—	—	Mathews
			D, Quiz	—	—	—	—	10	—	—	Mathews
			E, Quiz	—	—	—	—	11	—	—	Mathews
			II, Lecture	2	—	2	—	—	—	228 N. H.	Garner
			F, Quiz	—	—	—	1	—	—	—	Cushman
			G, Quiz	—	—	—	2	—	—	—	Cushman
			H, Quiz	—	—	—	—	1	—	—	Cushman
			I, Quiz	—	—	—	—	2	—	—	Garner
			J, Quiz	—	—	—	—	2	—	—	Cushman

1a. American Government and Politics.—National, state, and local government. (Open only to students in the Colleges of Engineering and Agriculture.) *I*; (2).

Prerequisite: Thirty hours of university work. No credit is allowed for this course if the student has already had or subsequently takes course 1 or 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 1a	2		—	—	10	—	10	—	—	308 L. H.	Cushman

16. Government of Illinois.—Constitutional development; the legislature; the executive departments; the administrative boards and commissions; the judiciary; county, town, and city government. Lectures; discussion. *II*; (2).

Prerequisite: Thirty hours of university work.

NOTE.—Students may not take both 3 and 16 for more than a total of four hours' credit without special permission of the department.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 16	2		Lecture	—	—	—	8	—	—	202 L. H.	Story
			A, Quiz	—	8	—	—	—	—	—	Story
			B, Quiz	—	9	—	—	—	—	—	Story

Courses for Advanced Undergraduates and Graduates

NOTE.—Junior standing is required for admission to the following courses:

4. Municipal Government.—The growth of cities; their legal and social status; municipal organization in the United States, including mayor and council, commission, and city manager plans; municipal organization abroad; municipal functions. *I*; (3).

Prerequisite: Senior standing, or junior standing and one of the following: (1) Three hours in either political science or sociology; (2) Five hours in either economics or history; (3) Major work in civil or in municipal and sanitary engineering.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 4	2		Lecture	8	—	—	—	8	—	202 L. H.	Story
			A, Discussion	—	—	8	—	—	—	—	Story
			B, Discussion	—	—	9	—	—	—	—	Story

Political Science

5. Constitutional Law of the United States.—The judicial interpretation of the constitution. Judicial power to declare laws unconstitutional; separation of governmental powers; relation of state and national governments; national taxation; control of interstate commerce; protection of civil and political rights (due process of law); jurisdiction of the courts. *I*; (3).

Prerequisite: Political Science 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 5	3	—	—	9	—	9	—	9	—	317 L. H.	Cushman

6. International Law.—The development, nature, source, and present status of the law of nations; the doctrine of intervention; the laws of war and peace; the rights and duties of neutrals; the arbitration movement. Lectures; assigned readings; reports. *I*; (3).

Prerequisite: Graduate or senior standing, or junior standing with six hours of history and five hours of political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 6	3	—	—	3	—	3	—	3	—	317 L. H.	Garner

7. American Diplomacy.—The genesis and present organization of the Department of State; the diplomatic service; the treaty making power; the methods and traditional principles of the foreign policy of the United States; diplomatic controversies with foreign powers; the United States as a world power. *II*; (3).

Prerequisite: Political Science 1 or History 3a-3b; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 7	3	—	—	2	—	2	—	2	—	317 L. H.	Mathews

9. Principles of Jurisprudence.—The nature and sources of law; development and comparison of the Roman and English legal systems; English law in the United States; classification of law. *II*; (2).

Prerequisite: Political Science 1 or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 9	2	—	—	—	10	—	10	—	—	306 L. H.	Fairlie

10. Administrative Law in the United States.—Organization of federal and state administrative systems; separation of powers and delegation of legislative power; powers of administrative officers; administrative procedure; remedies of the individual against unlawful action of public officers. *II*; (3).

Prerequisite: Political Science 5, or senior standing and six hours of political science.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 10	3	—	—	10	—	10	—	10	—	308 L. H.	Cushman

11. Constitutional Aspects of Social and Industrial Problems.—The nature of the police power; legislation concerning public health, order, and safety; constitutionality of labor legislation; control of combinations of capital; regulation of public service companies. *II*; (3).

Prerequisite: Six hours of political science or economics.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 11	2	—	—	B	—	9	—	9	—	317 L. H.	Cushman

12. National Administration.—Administrative powers of the President and Congress; principles of administrative organization; the President's cabinet, the executive departments, boards and commissions and administrative services of the national government; judicial administration and the relation of the courts to the executive authorities. *II*; (3).

Prerequisite: Political Science 1; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 12	3	—	—	11	—	11	—	11	—	317 L. H.	Fairlie

13. State Administration in the United States.—Organization and methods of the executive departments of the state governments: the governor, heads of administrative departments, boards and commissions, and the civil service. Tendencies toward centralization in taxation, education, and the enforcement of state law. *I*; (3).

Prerequisite: Political Science 3 or its equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 13	3	—	—	11	—	11	—	11	—	317 L. H.	Mathews

14. Political Parties and Methods.—Development and organization of political parties and political methods, primarily in the United States; recent legislation on primary elections and corrupt practises; criticism and defense of the party system. *I*; (2).

Prerequisite: One course in political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 14	2	—	—	—	10	—	10	—	—	306 L. H.	Fairlie

14a. Primary and Election Problems.—(Supplemental to course 14.) Special reports and discussions. *I*; (1). *Time to be arranged.*

Professor FAIRLIE

Prerequisite: Registration in Political Science 14.

18. Legislation in the United States.—Nature of the legislative power; constitutional limitations; organization, rules of procedure, and practise of American legislative bodies; bill drafting; reference bureaus; criticism of bills and discussion of principles of legislation. *II*; (3).

Prerequisite: Six hours of political science; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 18	2	—	—	8	—	8	—	8	—	317 L. H.	Story

Political Science

21. British Government.—Political institutions in the United Kingdom and the British dominions; the Crown, the Cabinet, the House of Commons and the House of Lords; the party system; the courts of law; local government; the crown colonies and the self-governing dominions; recent developments and proposed changes. *I*; (3).

Prerequisite: Graduate or senior standing, or junior standing with six hours of political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 21	3	—	—	2	—	2	—	2	—	317 L. H.	Fairlie

22. Continental European Governments.—The political systems of France, Germany, Austria-Hungary, Italy, and Switzerland; constitutional beginnings; political organizations; methods of legislation and administration; constitutional guaranties for the protection of individual rights. *II*; (3).

Prerequisite: Open to graduate students and seniors, who have had six hours in political science. History 20a-20b and Political Science 21 recommended.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 22	3	—	—	3	—	3	—	3	—	317 L. H.	Garner

28. Problems of Contemporary Politics.—A study of some of the larger questions of present day politics; such as the reorganization of state government; state socialism; immigration; foreign and colonial policies; parliamentary government; direct popular government. *I*; (2).

Prerequisite: Senior standing and one course in political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 28	2	—	—	—	8	—	8	—	—	317 L. H.	Story

34. Municipal Problems.—Municipal administration in the United States and Europe; principles of administrative organization; city planning and housing; public utilities; police and sanitary administration; municipal finances: Lectures; readings; special reports. *II*; (3).

Prerequisite: Open to graduate students, and to undergraduate students who have had Political Science 4 or who have senior standing in the curriculum in municipal or highway engineering.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Political Science 34	3	—	—	10	—	10	—	10	—	317 L. H.	Fairlie

36a-36b. Thesis Course.—Research work for candidates for honors and other seniors. *I, II*; (2). *Time to be arranged.*

Courses for Graduates

[101. History of Political Theories.—Ancient, medieval, and modern political thought; political theories of Aristotle, Plato, Machiavelli, Hobbes, Locke, Montesquieu, and others. American political philosophy. Not given in 1916-17. *Twice a week; I*; (1 unit). Professor GARNER]

102. The Nature of the State.—Principles, methods, and nature of political science; the origin, attributes, forms, and functions of the state; sovereignty

and liberty; citizenship and nationality; constitutions, their nature and forms; principles of legislative, executive and judicial organization. Alternating with course 101. Given in 1916-17. *Twice a week; I; (1 unit). Time to be arranged.*

Professor GARNER

103. Seminar in Political Science and Public Law.—Special problems; reports; discussions and criticism. The research work of candidates who are writing theses is under the direction of some instructor to whom they report frequently. *I, II. Time to be arranged.*

106. International Law as Applied During the European War.—Causes of the war; treatment of alien enemies; contraband; blockades; transfers of flag; reprisals; fines; contributions and requisitions; rights and duties of neutrals. *Twice a week; II; (1 unit). Time to be arranged.* Professor GARNER

112. Studies in Public Administration.—Special topics in comparative national or local administration. *Twice a week; I; (1 unit).*

Professor FAIRLIE

113. Topics in State Government and Administration.—Studies in the organization and methods of state governments in formulating and executing public policies; investigation of problems. Different topics in succeeding years. *Twice a week; II; (1 unit).*

Assistant Professor MATHEWS

PSYCHOLOGY

MADISON BENTLEY, Ph.D., *Professor*

CHRISTIAN ALBAN RUCKMICH, Ph.D., *Associate*

CARL RAHN, Ph.D., *Instructor*

ANNA SOPHIE ROGERS, A.M., *Assistant*

GEROLD CARL WICHMANN, A.B., *Assistant*

COLEMAN R GRIFFITH, A.B., *Assistant*

Major: Twenty hours chosen from courses announced by the department, except that six hours may be chosen from one or more of the following subjects: philosophy 1, 2, 3, 4; physics 1a-1b, 3a-3b, 7a-7b; zoölogy 2, 5, 9, 15; and animal husbandry 30.

Minors: Twenty hours chosen from education, genetics, philosophy, physics, physiology, sociology, and zoölogy.

1. Introduction to Psychology.—The facts and laws of consciousness. This course is preliminary to all the other work of the department. Lectures; sectional meetings. *I; (3).*

Prerequisite: One year of university work.

Subject	No. Credits		Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	1	3	Lecture	9	—	9	—	—	—	410 U. H.	Bentley
			A	—	—	—	—	9	—	417 U. H.	Ruckmich Rahn Rogers Wichmann
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	410 U. H.	
			D	—	—	—	—	10	—	417 U. H.	
			E	—	—	—	—	—	9	410 U. H.	
			F	—	—	—	—	—	9	418 U. H.	
			G	—	—	—	—	—	9	419 U. H.	
			H	—	—	—	—	—	9	420 U. H.	
			I	—	—	—	—	—	9	417 U. H.	
			K	—	—	—	2	—	—	410 U. H.	

Psychology

2. General Psychology.—Mental inheritance, habit, custom, and fashion; the relations of psychology to the biological and social sciences; comparative and genetic psychology, and the psychology of the abnormal; applications of psychology to the arts and professions. *II*; (3).

Prerequisite: Psychology 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	2	3	Lecture	9	—	9	—	—	—	100 Com.	Ruckmich
			A	—	—	—	—	9	—	417 U. H.	Ruckmich Rahn Wichmann
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	410 U. H.	
			D	—	—	—	—	10	—	417 U. H.	
			E	—	—	—	—	2	—	410 U. H.	

3. Laboratory Practise (Elementary).—Classical experiments in the fields of sensation, feeling, attention, and action. A drill course in scientific method. *I* or *II*; (2).

Prerequisite: Psychology 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	3	2	A	2,3	—	2,3	—	—	—	507 U. H.	Bentley
			B	—	10,11	—	10,11	—	—	507 U. H.	Ruckmich

SECOND SEMESTER										
A	2,3	—	2,3	—	—	—	507 U. H.	Ruckmich		
B	—	10.11	—	10.11	—	—	507 U. H.	Wichmann		

5. Comparative Psychology.—Mind in animal forms; the psychological implications of organic evolution; a comparison of human and animal minds; criticism of current literature. (Recommended to students who intend to elect advanced courses either in animal psychology or in the study of behavior.) Lectures; laboratory. *I*; (2).

Prerequisite: Psychology 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	5	2	—	—	2,3	—	2,3	—	—	510 U. H.	Bentley Rahn

6. Comparative Psychology (Advanced Laboratory).—Individual studies in animal psychology. *II*; *(2-4).

Prerequisite: Psychology 1 and 5.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	6	*2 to 4	—				(Arrange)			510 U. H.	Bentley Rahn

9. Physiological Psychology.—Correlations between the structure and functions of the nervous system and the phenomena of human consciousness; a formulation of the problem of psychophysical relationship. Lectures; readings; discussions. *II*; (3).

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Prerequisite: Psychology 1 and 2, or 1 and 3, and laboratory training in one of the biological sciences.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	9	3	—	10	—	10	—	10	—	507 U. H.	Rahn

10. German Reading.—Translation into English of a German psychological text. *I*; (1).

Prerequisite: Psychology 1 and an elementary knowledge of German.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	10	1	—	—	11	—	—	—	—	105 L. H.	Bentley

12-13. Minor Problems (Advanced Laboratory).—The formulation of methods suitable to new problems. *I, II*; *(2-5).

Prerequisite: Psychology 1, 2, 3.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	12	*2 to 5	—			(Arrange)				507 U. H.	Bentley Ruckmich Rahn

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	13	*2 to 5	—			(Arrange)				507 U. H.	Bentley Ruckmich Rahn

14. Social Psychology.—The social consciousness and the collective mind; analysis of the conditions upon which the social consciousness depends; perceptual, ideational, and emotional factors in the social consciousness; the genetic development of the collective mind as revealed in tradition and institutions. *I*; (3).

Prerequisite: Psychology 1 and one other course.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	14	3	—	11	—	11	—	11	—	417 U. H.	Rahn

15. The Psychological Basis of Music.—(An elementary course.) Summary of experimental and theoretical literature on the origin of music, harmony, melody, rhythm, consonance, tonal quality; psychology of musical appreciation and performance. *I*; (2).

Prerequisite: Psychology 1; junior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	15	2	—	—	2	—	2	—	—	507 U. H.	Ruckmich

17. The History of Psychology.—The rise and development of the science of psychology. Lectures and reading in the sources. *II*; (2).

Prerequisite: Psychology 1, 2, and one other course.

*In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Railway Engineering

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	17	2	—	11	—	11	—	—	—	507 U. H.	Ruckmich

20. Systematic Psychology.—The nature of psychological analysis; classification of elementary processes; description of sensory and imaginal processes and the simpler complexes based upon historical and current researches. Lectures and essays. (For graduates and advanced undergraduates.) *II*; (3).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	20	3	—	9	—	9	—	9	—	417 U. H.	Bentley

21-22. Special Studies.—Individual investigations, for advanced students, in the form of essay or of experiment. *I, II*; (3).

Prerequisite: Psychology 1, and one other course.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	21	3	—	(Arrange)						507 U. H.	Bentley Ruckmich Rahn
Psychology	22	3	—	Schedule the same as for 21 (first semester).							

Courses for Graduates

103. Research.—Experimental and historical investigations. *I, II*; ($\frac{1}{2}$ to 2 units). *Time to be arranged.* Professor BENTLEY, Dr. RUCKMICH, Dr. RAHN

105. Seminar.—Discussion of current topics in their historical setting. *Once a week; I, II*; ($\frac{1}{2}$ unit). *Time to be arranged.* Professor BENTLEY

PUBLIC SPEAKING

(See under THE ENGLISH LANGUAGE AND LITERATURE.)

RAILWAY ADMINISTRATION

(See TRANSPORTATION.)

RAILWAY ENGINEERING

WILLIAM FREEMAN MYRICK GOSS, M.S., D. Eng., *Director, Professor*

EDWARD CHARLES SCHMIDT, M.E., *Professor*

JOHN McBEATH SNODGRASS, B.S., *Assistant Professor, Railway Mechanical Engineering*

ALONZO MORRIS BUCK, M.E., *Assistant Professor, Railway Electrical Engineering*

ARTHUR FRANCIS COMSTOCK, C.E., *Associate, Railway Civil Engineering*

OTTO STERNOFF BEYER, JR., M.E., *First Assistant, Engineering Experiment Station*

HAROLD HOUGHTON DUNN, B.S., *Assistant, Engineering Experiment Station*

Railway Civil Engineering—Courses 31-51.

Railway Electrical Engineering—Courses 60-68.

Railway Mechanical Engineering—Courses 1-10.

Common to all groups—Courses 25 and 30.

2. Locomotive Design.—Calculations and designs of engine and boiler details; current standards and proportions. Drafting room systems. *I*; (3).

Prerequisite: Mechanical Engineering 12, 62; Railway Engineering 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	2	3	W	1-4	—	1-4	—	1-4	—	103 T. B.	Snodgrass

5. Railway Laboratory.—Locomotive testing; experimental work with electric and steam railway test cars, brakeshoe testing machine, drop testing machine and air-brake apparatus. *I*; (3).

Prerequisite: Railway Engineering 6; Mechanical Engineering 12, 62.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	5	3	W	—	8-11	—	11	—	8-11	105 T. B.	Snodgrass Beyer

6. Locomotives.—Mechanics; performance; design. *II*; (4).

Prerequisite: Theoretical and Applied Mechanics 21, 29; registration in Mechanical Engineering 12 and 62.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	6	4	W	9	—	9	—	9	9	215 T. B.	Schmidt

7. Advanced Design.—Problems in locomotive and car design. *II*; (3).

Prerequisite: Railway Engineering 2.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	7	3	W	—	8-11	2,3	8-11	—	—	103 T. B.	Snodgrass

8. Railway Laboratory.—Investigation of train resistance and locomotive tractive effort by the use of the railway test car. Analysis of the results and their application to the problems of tonnage rating. *II*; (2).

Prerequisite: Railway Engineering 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	8	2	W	—	—	—	11	—	8-11	105 T. B.	Snodgrass Beyer

9. Seminar.—Discussion of current topics and review of railway journals; assigned topics and reports. *I*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	9	1	W	—	11	—	—	—	—	105 T. B.	Schmidt Snodgrass

25. Railway Development.—History and organization of steam and electric railways; statistics; costs. *I*; (3).

Prerequisite: Open to juniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	25	3	—	—	10	—	10	—	10	105 T. B.	Schmidt Snodgrass Buck Comstock

Railway Engineering

31. Railway Yards and Terminals.—Theory of design; arrangement of grades in gravity yards; problems. *II*; (3).

Prerequisite: Civil Engineering 51.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	81	3	U	1-4	1-4	—	8	—	—	103, 203 T. B.	Comstock

32. Railway Construction.—Advanced course in design of railway structures; study of cost analysis; preparation of estimates of cost, complete working drawings, and contracts and specifications for assigned problems in design. *I*; (3).

Prerequisite: Civil Engineering 51.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	32	3	U	1-4	—	—	—	1-4	9-12	103 T. B.	Comstock

33. Economic Theory of Railway Location.—Influence of volume of traffic, alignment, and gradient upon operating expenses; locomotive and grade problems; relocation of existing lines. *II*; (4).

Prerequisite: Civil Engineering 51; Theoretical and Applied Mechanics 20, 21.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	33	4	U	9	—	9	—	9	—	203 T. B.	Comstock
				—	—	—	—	1-4	—	103 T. B.	

34. Railway Maintenance.—Systems; track design; standards and charts; classification of accounts; measuring efficiency; emergency organization. *II*; (4).

Prerequisite: Civil Engineering 51.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	34	4	U	—	—	11	—	11	—	203 T. B.	Comstock
				11	—	1-4	—	—	—	103 T. B.	

35. Railway Signaling.—Block and route signaling; systems in current use; history of development; study of railway accidents. *I*; (1).

Prerequisite: Civil Engineering 51.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	35	1	U	—	—	9	—	—	—	203 T. B.	Comstock

50-51. Seminar.—Current topics; review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	50	1	U	—	—	—	—	9	—	203 T. B.	Comstock

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	51	1	U	—	—	—	11	—	—	203 T. B.	Comstock

60. Electric Railway Principles.—Mechanics of traction; train resistance; braking of electric railway trains; method of solving fundamental electric railway problems. *II*; (2).

Prerequisite: Theoretical and Applied Mechanics 25; Electrical Engineering 25, 75.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	60	2	V	—	8	—	8	—	—	105 T. B.	Buck

61. Electric Traction.—Selection and operation of equipment. A condensed course for students in railway mechanical engineering or other engineering departments. *II*; (3).

Prerequisite: Theoretical and Applied Mechanics 21 or 25; Electrical Engineering 11, 61, or 25, 75.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	61	3	V	8	—	8	—	8	—	105 T. B.	Buck

62. Electric Railway Laboratory.—Tests of electrical machinery used in railway service. *I*; (2).

Prerequisite: Railway Engineering 60.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	62	2	V	—	—	—	8	—	—	105 T. B.	Buck
				—	8-11	—	—	—	—	E. L.	

63. Electric Railway Laboratory.—(A continuation of Course 62.) Tests with the electric test car and the steam dynamometer car to determine train resistance and power consumption. *II*; (2).

Prerequisite: Railway Engineering 62, 64.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	63	2	V	—	—	—	10	—	—	105 T. B.	Buck
				—	9-12	—	—	—	—	E. L.	

64. Electric Railway Practise.—Types of equipment; energy consumption; methods of distribution. *I*; (3).

Prerequisite: Theoretical and Applied Mechanics 25; Electrical Engineering 26, 76; Railway Engineering 60.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	64	3	V	9	—	9	—	9	—	105 T. B.	—

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

65. Electric Railway Economics.—Location and operation; choice of systems; location of power plant and sub-stations; calculation of transmission and distribution of circuits; maintenance of way and of equipment; electrification of steam roads. *II*; (4).

Prerequisite: Railway Engineering 64.

Romance Languages and Literature

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	65	4	V	9	—	9	9	9	—	105 T. B.	Buck

66. Electric Railway Machinery.—Theory and characteristics of electrical machinery used for railway service, of transmission and distribution lines. *I*; (3).

Prerequisite: Railway Engineering 60; Electrical Engineering 26, 76.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	66	3	V	8	—	8	—	8	—	105 T. B.	Buck

67-68. Seminar.—Current topics; review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	67	1	V	—	9	—	—	—	—	105 T. B.	Buck

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	68	1	V							105 T. B.	Buck

98. Thesis.—Independent solution of some railway problem or the investigation of some subject. The thesis may consist of an original design or of an original experimental investigation, or may be the analysis and discussion of facts already in existence. *II*; (3). *Time to be arranged.*

Professor SCHMIDT, Assistant Professor SNODGRASS, Assistant Professor BUCK, Mr. COMSTOCK.

Courses for Graduates

Entrance upon graduate work in railway engineering presupposes the full undergraduate course in that subject.

102. Locomotive Design.—Modern practise concerning steam pressure, compounding, superheating. *Time to be arranged.* Professor Goss

106. Locomotive Operation.—Train resistance and tractive effort; tonnage ratings. *Time to be arranged.* Professor SCHMIDT

108. Electric Railway Practise.—The design, selection, operation, and maintenance of equipment; central station, sub-station, rolling stock, and line equipment. *Time to be arranged.* Assistant Professor BUCK

110.—Railway Location.—The effects of location upon earning capacity; problems in original location, in the relocation and reduction of grades of existing lines. *Time to be arranged.* Mr. COMSTOCK

RHETORIC

(See ENGLISH.)

ROMANCE LANGUAGES AND LITERATURE

KENNETH MCKENZIE, Ph.D., *Professor*

THOMAS EDWARD OLIVER, Ph.D., *Professor*

JOHN DRISCOLL FITZ-GERALD, II, Ph.D., *Professor of Spanish*

Romance Languages and Literature

DAVID HOBART CARNAHAN, Ph.D., *Associate Professor*
 DAVID SIMON BLONDHEIM, Ph.D., *Assistant Professor*
 ARTHUR ROMEYN SEYMOUR, Ph.D., *Associate*
 OLIN HARRIS MOORE, Ph.D., *Associate*
 CHARLES SERAPHIN CARRY, *Assistant*
 LOUIS ALLEN, A.M., *Assistant*
 RAFAEL ARCANGEL SOTO, B.S., A.B., *Assistant*
 ERIC ALLEN DAWSON, A.M., *Assistant*
 CINCINNATI GIOVANNI BATTISTA LAGUARDIA, A.B., *Assistant*
 HERBERT KING STONE, A.B., *Assistant*
 JOHN RAYMOND SHULTERS, A.M., *Assistant*
 MANUEL LÓPEZ, A.B., *Assistant*
 LOUIS PHILIP COSTA, A.M., *Assistant*
 PARK POWELL, A.B., B.S., *Assistant*

FRENCH

Major: 20 hours of French, exclusive of French 1a, 1b, 2a, 6a, 6b, 9a, and 9b.

Minors: 20 hours in not more than three of the following subjects: English (excluding Rhetoric 1-2), German, Greek, Italian, Latin, Spanish, history, and philosophy, provided that 8 hours must be taken in one subject other than a Romance language.

ROMANCE LANGUAGES

Major: 20 hours in French and one other Romance Language, exclusive of French 1a, 1b, 2a, 6a-6b, 9a, 9b, Italian 1a-1b, Portuguese 1a-1b, Spanish 1a-1b.

Minors: 20 hours in not more than three of the following subjects: English (excluding Rhetoric 1-2); German, Greek, Italian, Latin, Spanish, history, and philosophy, provided that the minor does not include any language contained in the major in Romance Languages.

A. FRENCH

Courses for Undergraduates

1a. Elementary Course.—Grammar; pronunciation; reading of modern authors; composition; conversation. *I or II; (4).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	1a	4	A	—	8	8	8	8	—	109 U. H.	Shulters
			B	—	8	8	8	8	—	318 U. H.	Allen
			C	—	8	8	8	8	—	512 U. H.	Powell
			D	—	9	9	9	9	—	208 U. H.	Moore
			E	—	9	9	9	9	—	206 U. H.	—
			F	—	10	10	10	10	—	410 U. H.	Allen
			G	—	10	10	10	10	—	109 U. H.	Shulters
			H	—	10	10	10	10	—	208 U. H.	—
			J	—	11	11	11	11	—	208 U. H.	Stone
			K	1	1	1	1	—	—	207 U. H.	—
			L	1	1	1	1	—	—	208 U. H.	Stone
			M	2	2	2	2	—	—	208 U. H.	Carry
			(Primarily for students in Engineering.)								
			R	—	9	9	9	9	—	— E. H.	Dawson
			S	—	11	11	11	11	—	422 E. H.	Dawson
			T	—	11	11	11	11	—	219 E. H.	Powell
SECOND SEMESTER											
				—	8	8	8	8	—	111 U. H.	Dawson

Romance Languages and Literature

1b. Elementary Course.—(Continuation of 1a.) *I* or *II*; (4).

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	1b	4	—	—	8	8	8	8	—	111 U. H.	Dawson

2a-2b. Modern Prose, Poetry, and Drama.—Rapid reading of modern authors; advanced syntax and composition. *I, II*; (4).

Prerequisite: French 1a-1b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	2a	4	A	—	8	8	8	8	—	207 U. H.	Moore
			B	—	9	9	9	9	—	207 U. H.	Blondheim
			C	—	10	10	10	10	—	207 U. H.	Stone
			D	—	11	11	11	11	—	207 U. H.	Oliver
			E	2	2	2	2	—	—	207 U. H.	Carnahan

SECOND SEMESTER

French 2b 4 Sections and schedule the same as for 2a (first semester).

5a-5b. Introduction to French Literature.—Authors of the last three centuries. Composition; review of the grammar. Not open to students who have had French 2a-2b. *I, II*; (3).

Prerequisite: French 2a-2b, or an equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	5a	3	A	10	—	10	—	10	—	211 L. H.	Fitz-Gerald
			B	11	—	11	—	11	—	211 L. H.	Moore

SECOND SEMESTER

French 5b 3 Sections and schedule the same as for 5a (first semester).

6a-6b. Second-Year Conversation.—Mainly classroom work. (Does not count toward a major in French.) *I, II*; (1).

Prerequisite: French 1a-1b, with a grade of at least 85.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	6a	1	A	—	9	—	9	—	—	211 L. H.	Carry
			B	—	10	—	10	—	—	211 L. H.	Carry

SECOND SEMESTER

French 6b 1 Sections and schedule the same as for 6a (first semester).

7a-7b. Intermediate Composition and Conversation.—Conducted entirely in French, giving facility in idiomatic expression in writing and speaking. Reading; themes; talks upon France and French life. *I, II*; (2).

Prerequisite: French 2a-2b, or 6a-6b.

NOTE.—Required of those who are given the recommendation of the department to teach French.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	7a	2	A	8	—	8	—	—	—	211 L. H.	Carry
			B	—	8	—	8	—	—	211 L. H.	Carry

SECOND SEMESTER

French 7b 2 Sections and schedule the same as for 7a (first semester).

8a-8b. Advanced Composition and Conversation.—French life and literature. Idiomatic construction; syntax; themes. Conducted entirely in French. *I, II; (2).*

Prerequisite: French 7a-7b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	8a	2	—	—	11	—	11	—	—	211 L. H.	Carry

SECOND SEMESTER											
French	8b	2	—	Schedule the same as for 8a (first semester).							

25. Course for Teachers.—Methods of teaching French in this country and abroad; actual contact with class-room problems. *I; (2).*

Prerequisite: Twenty-four hours' credit in French, including French 7a-7b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	25	2	—	—	9	—	9	—	—	216 L. H.	Carnahan

28a-28b. Senior Thesis.—For candidates for honors in French; open to other seniors. *I, II; (1). Time to be arranged.*

Courses for Advanced Undergraduates and Graduates

Prerequisite for the courses following: at least three years of college French or the equivalent.

10a-10b. Survey of French Literature.—Special periods and authors. The main currents of French literature from the beginning to the present time. *I, II; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	10a	3	—	9	—	9	—	9	—	211 L. H.	Carnahan

SECOND SEMESTER											
French	10b	3	—	Schedule the same as for 10a (first semester).							

24a-24b. Seventeenth and Eighteenth Century Drama.—Corneille, Racine, Molière, Voltaire, Marivaux, Sedaine, Beaumarchais. Lectures and interpretation. *I, II; (2).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	24a	3	—	9	—	9	—	9	—	117 L. H.	Oliver

SECOND SEMESTER											
French	24b	3	—	Schedule the same as for 24a (first semester).							

17a-17b. Nineteenth Century Drama.—Victor Hugo, Dumas, Augier, Sardou, Becque, Brieux, Hervieu, Bourget, Donnay, Rostand, and other dramatists. Dramatic criticism. *I, II; (2).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	17a	2	—	—	—	10	—	10	—	117 L. H.	McKenzie

SECOND SEMESTER											
French	17b	2	—	Schedule the same as for 17a (first semester).							

Romance Languages and Literature

45b. French Realism.—Flaubert, Maupassant, E. and J. de Goncourt, Daudet, Zola. Lectures; reports on collateral reading. Conducted in French if desired. *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
French	45b	2	—	—	9	—	9	—	—	117 L. H.	Moore

50a-50b. French Phonetics and Pronunciation.—Elementary phonetics; a detailed study of present-day pronunciation; practical exercises. *I, II*; (1). *Time to be arranged.* Assistant Professor BLONDHEIM

Courses for Graduates

Before entering upon the study of Romance Languages as a major for an advanced degree, a candidate must have had at least (a) three years of college work in French, together with a reading knowledge of Italian or Spanish; or (b) two years of college work in French and the same in Italian or Spanish. The candidate must also have had satisfactory training in Latin, and be able to read German prose.

Graduate students who select Romance languages as a first or second minor must have had at least two years of college work in the language desired and be able to read German prose.

101. Old French Epic Literature.—Critical reading and interpretation of national and courtly epics and collateral study of their history. *Twice a week; I, II*; (1 unit). *Time to be arranged.* Professor OLIVER

106. Early French Drama.—Origins and development to the Renaissance. *Twice a week; I, II*; (1 unit). *Time to be arranged.*

Associate Professor CARNAHAN

104. Eighteenth Century Prose Writers.—Society, culture, and prose literature of the eighteenth century; the attack upon the classic ideals; growth of the revolutionary spirit; first movements towards romanticism. *Once a week; I, II*; ($\frac{1}{2}$ unit). *Time to be arranged.* Professor OLIVER

139. French Literary Criticism of the Nineteenth Century.—*Twice a week; I, II*; (1 unit). *Time to be arranged.* Assistant Professor BLONDHEIM

B. ITALIAN

Courses for Undergraduates

1a-1b. Elementary Course.—Grammar; composition; conversation; reading. *I, II*; (3).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Italian	1a	3	—	11	—	11	—	11	—	117 L. H.	McKenzie Laguardia

				SECOND SEMESTER	
Italian	1b	3	—	Schedule the same as for 1a (first semester).	

Course for Advanced Undergraduates and Graduates

2a-2b. Italian Literature.—Italian writers of the nineteenth century. Composition; conversation. Introduction to the study of Dante. *I, II*; (2). *Time to be arranged.* Professor MCKENZIE

Prerequisite: A reading knowledge of Italian.

Course for Graduates

143. Italian Literature of the Fifteenth and Sixteenth Centuries.—*Twice a week; I; (1 unit). Time to be arranged.* Professor MCKENZIE

C. PORTUGUESE

Course for Undergraduates

1a-1b. Elementary Course.—Grammar; conversation; reading. *I, II; (4).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Portuguese	1a	4	—	—	11	11	11	11	—	111 U. H.	Costa

SECOND SEMESTER

Portuguese	1b	4	Schedule the same as for 1a (first semester).								
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D. SPANISH

Courses for Undergraduates

1a. Elementary Course.—Grammar; pronunciation; reading; composition; conversation. *I or II; (4).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor		
Spanish	1a	4	A	—	8	8	8	8	—	208 U. H.	Soto		
			B	—	8	8	8	8	—	206 U. H.	Laguardia		
			C	—	9	9	9	9	—	310 U. H.	López		
			D	—	10	10	10	10	—	206 U. H.	López		
			E	—	10	10	10	10	—	219 E. H.	Costa		
			F	—	11	11	11	11	—	206 U. H.	Shulters		
			G	1	1	1	1	—	—	206 U. H.	Laguardia		
			H	2	2	2	2	—	—	513 U. H.	Costa		
			(Primarily for students in Engineering)										
			R	—	9	9	9	9	—	214 U. H.	Powell		
			S	—	11	11	11	11	—	101 E. H.	—		
			T	—	11	11	11	11	—	—	López		
			W	2	2	2	2	—	—	111 U. H.	Allen		

SECOND SEMESTER

—	—	11	11	11	11	—	—	U. H.	López
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1b. Elementary Course.—(Continuation of 1a.) *II; (4).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor		
Spanish	1b	4	A	—	8	8	8	8	—	208 U. H.	Soto		
			B	—	8	8	8	8	—	206 U. H.	Laguardia		
			C	—	9	9	9	9	—	310 U. H.	López		
			D	—	10	10	10	10	—	206 U. H.	López		
			E	—	10	10	10	10	—	U. H.	Costa		
			F	—	11	11	11	11	—	206 U. H.	Shulters		
			G	1	1	1	1	—	—	206 U. H.	Laguardia		
			H	2	2	2	2	—	—	513 U. H.	Costa		
			(Primarily for students in Engineering)										
			R	—	9	9	9	9	—	—			
S	—	11	11	11	11	—	—						
T	—	11	11	11	11	—	—		López				
W	2	2	2	2	—	—	111 U. H.	Allen					

Romance Languages and Literature

2a-2b. Modern Spanish.—Rapid reading of modern authors; advanced grammar; conversation; composition; commercial correspondence. *I, II; (4).*

Prerequisite: Spanish 1a-1b, or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Spanish	2a	4	A	—	10	10	10	10	—	308 U. H.	Fitz-Gerald
			B	—	11	11	11	11	—	513 U. H.	Soto
			C	2	2	2	2	—	—	109 U. H.	Soto

SECOND SEMESTER

Spanish 2b 4 Sections and Schedule the same as for 2a (first semester).

3a-3b. Introduction to Spanish Literature.—Rapid reading of modern authors, and of the more important writers of the seventeenth century. *I, II; (3).*

Prerequisite: Spanish 2a, 2b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	3a	3	---	8	--	8	--	8	--	308 U. H.	Seymour

SECOND SEMESTER

Spanish 3b 3 — Schedule the same as for 3a (first semester).

4a-4b. Business Correspondence and Conversation.—Reading of facsimile business correspondence; writing of business letters; conversation. Reports in Spanish on consular and governmental documents. Conducted in Spanish. *I, II; (2).*

Prerequisite: Spanish 2a-2b.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Spanish	4a	2	—	—	11	—	11	—	—	117 L. H.	Seymour

SECOND SEMESTER

Spanish 4b — Schedule the same as for 4a (first semester).

Course for Advanced Undergraduates and Graduates

11a-11b. The Spanish Drama of the Sixteenth and Seventeenth Centuries.—Earlier dramatists; representative plays of Lope de Vega, Calderon, Ruiz de Alarcon and Tirso de Molina. Reports on outside reading. *I, II; (2).*

Prerequisite: Spanish 3a-3b.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Spanish	11a	2	—	—	10	—	10	—	—	117 L. H.	Seymour

SECOND SEMESTER

Spanish 11b — Schedule the same as for 11a (first semester).

Courses for Graduates

133. Origins of the Spanish Novela and Comedia.—*Twice a week; I, II; (1 unit). Time to be arranged.* Professor FITZ-GERALD

134. The Spanish Ballad.—*Twice a week; I, II; (1 unit). Time to be arranged.* DR. SEYMOUR

E. ROMANCE PHILOLOGY

Courses for Graduates

175. Old French Phonology and Morphology.—Development of Old French from Vulgar Latin. *Twice a week; I, II; (1 unit). Time to be arranged.*

Assistant Professor BLONDHEIM

181. Origins of the Italian Language.—Italian literature previous to Dante. *Twice a week; II; (1 unit). Time to be arranged.*

Professor MCKENZIE

185. Oldest Monuments of the Spanish Language.—Origins of Spanish poetry. Historical grammar. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor FITZ-GERALD

195. Seminar.—Research work in preparation for theses.

Members of the department

SCANDINAVIAN LANGUAGES AND LITERATURE

(See GERMANIC LANGUAGES AND LITERATURE.)

THE SOCIAL SCIENCES

(See ECONOMICS, HISTORY, POLITICAL SCIENCE, and SOCIOLOGY.)

SOCIOLOGY

EDWARD CARY HAYES, PH.D., *Professor*

JAMES GARFIELD STEVENS, PH.D., *Associate*

HERBERT KNIGHT DENNIS, PH.D., *Assistant*

Major: 20 hours from any courses offered in the department.

Minors: 20 hours chosen from two or three of the following subjects: History, economics, political science, philosophy, and psychology.

Courses for Undergraduates

1. The Principles of Sociology and Their Application to Present Problems.—*I or II; (3).*

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	1	3	A	8	—	8	—	8	—	306 L. H.	Dennis
			B	9	—	9	—	9	—	306 L. H.	Hayes
			C	—	8	—	8	—	8	306 L. H.	Dennis
			D	11	—	11	—	11	—	306 L. H.	Hayes
			E	9	—	9	—	9	—	320 L. H.	Dennis
			F	11	—	11	—	11	—	308 L. H.	Dennis
			G	11	—	11	—	11	—	308 L. H.	Stevens
SECOND SEMESTER											
			A	8	—	8	—	8	—	306 L. H.	Dennis
			B	11	—	11	—	11	—	308 L. H.	Dennis

2. Social Psychology and Social Control.—A summary of certain teachings of Tarde, Le Bon, Durkheim, Siddings, Ward, and others, with special ref-

Sociology

erence to the ways in which the sentiments, opinions, and conduct of the members of society are shaped. *II; (3). Time to be arranged.* Mr. DENNIS

Prerequisite: Sociology 1.

7. The Social Problems of the Rural Community.—*II; (2).*

Prerequisite: Junior standing.

			SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Sociology	7	2	Lecture	—	11	—	—	—	—	202 L. H.	Hayes	
			A, Quiz	—	—	—	11	—	—	306 L. H.	Dennis	
			B, quiz	—	—	—	—	—	11	306 L. H.	Dennis	
			C, quiz	—	2	—	—	—	—	306 L. H.	Dennis	
			D, quiz	—	—	—	2	—	—	306 L. H.	Dennis	

Courses for Advanced Undergraduates and Graduates

3. **Social Evolution.**—Modes of social activity among savage, barbarous, and civilized people; family organization, practical arts, economic wants and institutions, origins of government and law, codes of morality, religions; inductions from such facts, as to the theory of social evolution and the method of progress. *II; (3).*

* *Prerequisite:* Sociology 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	3	3	—	11	—	11	—	11	—	306 L. H.	Haves

8. **Charities.**—Evolution of modern organized philanthropy, public and private; causes and prevention of poverty; organization and management of charitable institutions. *I; (3).*

Prerequisite: Sociology 1 or Economics 1; junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	8	3	A	8	—	8	—	8	—	308 L. H.	Stevens
			B	—	9	—	9	—	9	308 L. H.	Stevens

9. **Criminology.**—Nature, causes, and treatment of the criminal; evolution of modern methods of criminal procedure and penology; recent experiments and tendencies. *II; (3).*

Prerequisite: Sociology 1 or senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	9	3	A	8	—	8	—	8	—	308 L. H.	Stevens
			B	9	—	9	—	9	—	308 L. H.	Stevens
			C	—	8	—	8	—	8	308 L. H.	Stevens

10. **Population.**—Theories and policies of population; Malthus' Principle and its critics; problems in the population of the United States; immigration, race-mixture, conditions affecting public health, death-rate, birth rate, "race-suicide," marriage, divorce; selective influences at work on the "population type." *I; (3).*

Prerequisite: Sociology 1 or Economics 1; senior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Sociology	10	3	—	3	—	8	—	3	—	306 L. H.	Stevens

11. General Sociology.—Systematic presentation and critical discussions of the main teachings of sociology. *I*; (3).

Prerequisite: Senior standing and the consent of the instructor.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Sociology	11	3	—	10	—	10	—	10	—	306 L. H.
										Hayes

14. Social Statistics.—Social investigation and research. Social and community surveys. The verification of sociological laws and principles by the statistical method. Vital statistics and population in the light of data afforded by official publications and special investigations. The statistical method applied to sociology and social problems. *II*; (3).

Prerequisite: Sociology 1 or Economics 1, and, except in special cases, Sociology 10; senior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Sociology	14	3	—	3	—	3	—	3	—	306 L. H.
										Stevens

Courses for Graduates

Preparation for graduate work in sociology must include the equivalent of twelve semester hours in the social sciences, of which at least three must be in sociology, and three in the principles of economics. The remainder may be in any combination of these two subjects, or of history and political science.

102. The Development of Sociology.—Reading of sociological works; discussions; lectures. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor HAYES

150. Seminar.—Detection and statement of problems. Preparation of theses. *Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Professor HAYES

SPANISH

(See ROMANCE LANGUAGES AND LITERATURE.)

TRANSPORTATION

ERNEST RITSON DEWSNUP, A.M., *Professor*

Courses for Undergraduates

1. Transportation System of the United States.—The development and economic problems of railway and other transportation in this country. *I*; (3).

Prerequisite: Economics 1 or 2; junior standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Transportation	1	3	—	10	—	10	—	10	—	210 Com.
										Dewsnup

35a-35b. Thesis.—Investigation of problems in railway administration. A preliminary outline must be filed with the department by the second Friday of October, an extended outline and bibliography by the second Friday in Novem-

Transportation

ber, and a first draft of at least fifteen pages of the thesis must be submitted by the second Friday in January. *I, II; (2). Time to be arranged.*

Prerequisite: Full senior standing in railway administration.

Courses for Undergraduates and Graduates

2. Transportation Policy in Europe and in the United States.—The regulation of railways in the United States and Europe. *II; (3).*

Prerequisite: Transportation 1; Economics 1.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	2	3	—	10	—	10	—	10	—	210 Com.	Dewsnup

7. Railway Organization.—The departments and functions of the American railway; traffic and operating departments; relative merits of the departmental, divisional, and unit systems of organization; organizations of foreign railways; railway associations, labor, discipline, and training. *I; (2).*

Prerequisite: Accountancy 1 and Economics 1, previously or concurrently. For senior students in the College of Engineering, Economics 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	7	2	—	—	10	—	10	—	—	210 Com.	Dewsnup

12. Freight Shipment.—Preparation of goods for shipment, chiefly by railway; freight classifications; class ratings; rate adjustment in New England, Trunk Line and Central Freight Association Territory; main features of southern and western rate adjustment; the express and parcel post systems. *II; (2).*

Prerequisite: Transportation 7, or 60 hours of university work.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	12	2	—	—	10	—	10	—	—	100 Com.	Dewsnup

[13. Railway Traffic Administration.—Methods of passenger traffic management. *I; (3).* Not given in 1916-17.

Prerequisite: Transportation 7, or credit or concurrent registration in Transportation 1.]

17. Railway Terminal Management.—Freight and passenger terminals. *I; (3).*

Prerequisite: Transportation 7, or credit or concurrent registration in Transportation 1; Economics 1.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Transportation	17	3	—	9	—	9	—	9	—	210 Com.	Dewsnup

[22. Railway Train Service.—The standard code of train rules; its application to train dispatching; block-signaling practise; time-table construction. An inspection trip to Chicago of four days' duration forms part of this course. Expenses average about \$12.00. *II; (3).* Not given in 1916-17.

Prerequisite: Transportation 1, 7, and 13.]

26. The Economics of Railway Construction and Maintenance.—The bearing of traffic conditions upon location and types of construction; the present maintenance policy of the railways in regard to roadway and equipment. An inspection trip to Chicago of four days' duration, April 2, 3, 4, and 5, 1917, forms part of the course. Expenses average about \$12.00. *II*; (3).

Prerequisite: Transportation 1, 7, and 17.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Transportation	26	3	—	9	—	9	—	9	—	210 Com.	Dewsnup

Courses for Graduates

[101. Railway Rate Policy.—*Twice a week; I; (1 unit).* Not given in 1916-17.]

[102. The Fiscal Administration of American Railways.—*Twice a week; II; (1 unit).* Not given in 1916-17.]

103. Foreign Railway Administration.—*Twice a week; I; (1 unit).* Time to be arranged. Professor DEWSNUP

104a. Standards of Railway Operation.—The work of this course requires a cycle of three years for its completion, though credit will be given for each semester's work. 104a deals with organization and maintenance of standards, 104b with freight service, 104c with passenger service. *Once a week or, at the option of the instructor, twice a week; II; (1 unit).* Time to be arranged.

Professor DEWSNUP

ZOOLOGY

(Including HUMAN ANATOMY.)

HENRY BALDWIN WARD, PH.D., *Professor*

JOHN STERLING KINGSLEY, D.Sc., *Professor*

FRANK SMITH, A.M., *Professor*

CHARLES ZELENY, PH.D., *Professor*

VICTOR ERNEST SHELFORD, PH.D., *Assistant Professor*

HARLEY JONES VANCLEAVE, PH.D., *Associate*

HENRY GUSTAVE MAY, B.S., *Research Assistant*

BESSIE ROSE GREEN, A.M., *Assistant*

GEORGE MARSH HIGGINS, A.M., *Assistant*

RALPH HARLAN LINKINS, A.M., *Assistant*

JAMES ERNEST KINDRED, A.M., *Assistant*

ROBERT HILLS KINGMAN, A.M., *Assistant*

MORRIS JOHNSON KERNALL, A.M., *Graduate Assistant*

FRANCIS MARCK BALDWIN, A.M., *Graduate Assistant*

MINNA ERNESTINE JEWELL, A.B., *Graduate Assistant*

Major: 20 hours from any courses offered in the department, excluding Zoölogy 1, and including Zoölogy 3, 4, and 5.

Minors: 20 hours chosen from two or three of the following subjects: animal husbandry (Animal Husbandry 30), bacteriology, botany, chemistry, entomology, physics, physiology, psychology, paleontology, and physiography.

Zoology

Courses 1 and 2 constitute an introduction to later work in zoölogy. In the second year, a student may choose as a line of work either morphological, experimental, ecological, faunistic, or systematic courses. The courses on microscopical technique (3), heredity and evolution (5), and current literature (20) are of value for all students. Medical students should take courses 3 and 6 the second year. Those preparing to teach zoölogy in the high school should take invertebrate morphology (4), field zoölogy (16, 17), and ecology (9, 11), and a course in general entomology.

A. ZOOLOGY

Courses for Undergraduates

1. General Zoology.—Animal biology; principles of structure; function, inter-relations, origin, and development of animal life; the simpler and best-established generalizations in zoölogical theory. Lectures; laboratory; quiz work. *I* or *II*; (5).

				EITHER SEMESTER							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	1	5	Lecture	9	—	9	—	9	—	228 N. H.	Ward
			E, Quiz	—	—	8	—	—	—	249 N. H.	Shelford VanCleave and Assistants
			F, Quiz	—	—	—	—	8	—	249 N. H.	
			G, Quiz	—	1	—	—	—	—	247 N. H.	
			H, Quiz	—	—	—	1	—	—	247 N. H.	
			A, Laboratory	—	8,9	—	8,9	—	8,9	312 N. H.	
			B, Laboratory	10,11	—	10,11	—	10,11	—	312 N. H.	
			C, Laboratory	1,2	—	1,2	—	1,2	—	312 N. H.	
			*D, Laboratory	—	10,11	—	10,11	—	10,11	312 N. H.	

2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; the early stages of vertebrate embryology; structure of vertebrate tissues; anatomy of systems of organs considered in respect to their function, ontogeny, and evolution in the vertebrate series; anatomical studies of types of the Chordata. Lectures; laboratory; quiz work. *II*; (5).

Prerequisite: Zoölogy 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	2	5	Lecture	10	—	10	—	10	—	229 N. H.	Kingsley and Assistants
			A, Laboratory	8,9	—	8,9	—	8,9	—	330 N. H.	
			B, Laboratory	—	10,11	—	10,11	—	10,11	330 N. H.	
			C, Laboratory	—	1,2,3	—	1,2,3	—	—	330 N. H.	

4. Invertebrate Morphology.—Morphology of a series of invertebrates; invertebrate structure and development; the application of biological principles. Laboratory; lectures; demonstrations. *II*; (3).

Prerequisite: Zoölogy 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	4	3	—	—	1,2,3	—	1,2,3	—	—	312 N. H.	VanCleave

5. Heredity and Evolution.—(a) The facts of heredity and present views regarding them. (b) The proofs of organic evolution with a discussion of the probable factors involved in the process. Lectures; demonstrations; assigned reading. *II*; (2).

Prerequisite: One year of university work.

*Will not be opened second semester until after A, B, C have been filled.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	5	2	—	—	11	—	11	—	—	228 N. H.	Zeleny

Courses for Advanced Undergraduates and Graduates

3. Microscopical Technique and Vertebrate Embryology.—Theory and practise of microscopical technique; vertebrate embryo in early stages of development; methods of fixation, embedding, section cutting, staining, and mounting; preparation of material for use in introductory embryology. Lectures; laboratory. *I*; (3).

Prerequisite: Zoology 1, 2.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	3	3	—	—	1,2,3	—	1,2,3	—	—	403 N. H.	Kingsley

16. Economic Ornithology.—Common birds of the vicinity. Identification; food relations; seasonal distribution; migration activities. Economic importance of birds and their conservation. Lectures; assigned reading; a few field trips in the latter part of the semester. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	16	2	—	—	2	—	2	—	—	228 N. H.	Smith

19a-19b. Advanced Ornithology.—(Continuation of 16.) Systematic and field work; economic and technical literature. *I, II*; *(2 to 5). *Time to be arranged.* Professor SMITH

Prerequisite: Zoology 16 or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	3	3	Lecture	—	1	—	1	—	—	229 N. H.	Kingsley
			A, Laboratory	—	2,3	—	2,3	—	—	323 N. H.	
			B, Laboratory	10,11	—	10,11	—	—	—	323 N. H.	

6. Vertebrate Organogeny.—Development of the organs of the vertebrate body. Lectures; assigned readings; laboratory studies on embryos of the chick, dogfish, Amblystoma, and pig. (A continuation of course 3.) *II*; (3).

Prerequisite: Zoology 1, 2, 3.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	6	3	Lecture	1	—	—	—	1	—	229 N. H.	Kingsley
			A	2	—	1,2	—	1	—	323 N. H.	
			B	—	1,2	—	1,2	—	—	323 N. H.	

9. Animal Ecology.—The relations of animals to their natural environments. Field and experimental work; lectures on the natural history of mammals, birds, reptiles, and amphibians. *II*; (3).

Prerequisite: One year of zoology or one and one-half years of university work, including Zoology 1.

*In registering for a course with variable credit hours, a student must put down on his study list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Zoology

SECOND SEMESTER—FIRST HALF

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	9	3	Lecture	9	—	9	—	9	—	310 N. H.	Shelford

SECOND SEMESTER—SECOND HALF

Zoology	9	3	Laboratory	8,9	—	8,9	—	8,9	—	203 V. B.	
			or Field	8,9	—	—	—	—	8-12		

11. Experimental Ecology and Geography.—The physiology of environmental relations; analysis of behavior. World and regional aspects of behavior and ecology; animal distribution as related to climate and vegetation. *I*; *(2 or 4),

Prerequisite: One year of zoology and senior standing.

FIRST SEMESTER—FIRST HALF

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	11	*2 or 4	Lecture	—	—	4	—	4	—	247 N. H.	Shelford
			Laboratory	—	3-4	—	3-4	—	—	203 V. B.	
			or Field	—	—	—	—	—	8-3		

FIRST SEMESTER—SECOND HALF

Lecture	—	4	4	4	4	—	247 N. H.	Shelford
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25-26. Experimental Zoology.—Experimental embryology; regeneration; heredity; variation; evolution. Laboratory; assigned reading; conference. *I, II*; (5).

Prerequisite: Two years of university work, including one year in zoological courses.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	25	5	—	—	—	—	—	—	—	314 N. H.	Zeleny

(To be arranged)

SECOND SEMESTER

Zoology	26	5	—	Schedule the same as for 25 (first semester).							
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17. Field Zoology.—Collection, preservation, and identification of common representatives of the lower vertebrates and of the various groups of land and fresh-water invertebrates (excluding insects) in the vicinity; identification work on living and preserved material from larger rivers and lakes; observations on the habits and life histories of selected forms. Field and laboratory work; assigned readings. *I*; (4).

Prerequisite: One year in zoology, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	17	4	—	—	8,9	—	8,9	—	8-12	—	Smith

18. Advanced Field Zoology.—(A continuation of course 17.) Taxonomic or distributional problems in connection with the local fauna. *II*; *(3 to 5).

Prerequisite: Zoology 17.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	18	*3 to 5	—	—	—	—	—	—	—	316 N. H.	Smith

(Arrange)

* In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

22-23. Morphology of Vertebrates.—The skeleton and the brain, the cranial nerves, and the eye and ear. Lectures; laboratory work; dissection of types. *I, II; *(2 to 4).*

Prerequisite: Zoology 1, 2, 3, and 6.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Zoology	22	*2 to 4	—							330 N. H.
				(Arrange)						Instructor Kingsley

SECOND SEMESTER										
Zoology	23	4	—	Schedule the same as for 22 (first semester).						

21a-21b. Introduction to Zoological Research.—Morphology, life history, or reciprocal relations of invertebrates, especially parasites of man and other animals. Laboratory; conferences; assigned reading. *I, II; *(2 to 5).*

Prerequisite: One year in zoological courses, and senior standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Zoology	21b	*2 to 5	—							308 N. H.
				(Arrange)						Instructor Ward

SECOND SEMESTER										
Zoology	21b	*2 to 5		(Arrange)						308 N. H. Ward

20a-20b. Current Literature.—Presentation and discussion of the results of recent zoological investigation. (Open to all students of zoology; should be taken by those intending to graduate with a thesis.) *I, II; (1).*

Prerequisite: Three years of university work, including one year in zoology.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Zoology	20a	1	—	—	—	—	—	3	—	229 N. H.
										Instructor Zeleny

SECOND SEMESTER										
Zoology	20b	1	—	Schedule the same as for 20a (first semester).						

8a-8b. Senior Thesis.—Individual work on assigned topics. *I, II; (5).*
Time to be arranged. Members of the department

Prerequisite: Two years of zoology.

Courses for Graduates

Students entering upon graduate study in the department of zoology should have had two years of undergraduate work in the subject. When chosen as a minor the courses listed for graduates and undergraduates must be preceded by at least one full year's undergraduate work in zoology. Work done at other institutions will be evaluated on conference with the head of the department.

102. Vertebrate Morphology.—The origin of vertebrates, the segmentation of the head, and the morphology of special systems. Lectures; required reading. *Twice a week; I; (½ unit). Time to be arranged.* Professor KINGSLEY

* In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Zoology

107. Parasitology.—Structure and life history of animal parasites; their relations to disease; origin and biological significance of parasitism. Conferences; assigned readings; demonstrations. *Twice a week; I, II; (1 unit).* Given in 1916-17 and alternate years. *Time to be arranged.* Professor WARD

109. Physiological Ecology.—The regulatory mechanisms of organisms; neutrality; osmotic pressure; immunity; and temperature in relation to natural environments. Given in 1916-17 and alternate years. *II; ($\frac{1}{2}$ or 1 unit).* *Time to be arranged.* Assistant Professor SHELFORD

111. Experimental Ecology.—The repetition of published experiments in physiology and ecology. The student selects a topic on animal reactions or on the measurement of osmotic pressure, temperature, acidity, or conductivity, with modern apparatus. *I, II; ($\frac{1}{2}$ to 2 units).* *Time to be arranged.* Assistant Professor SHELFORD

115. Factors of Individual and Racial Development.—Experimental embryology; regeneration; heredity; variation; evolution. *Twice a week; I, II; (1 unit).* *Time to be arranged.* Professor ZELENY

117. Faunistic Zoology.—Problems in taxonomy, distribution, and ecology; field work, conference, and lectures. Students have the advantage of the collections, library, apparatus, and operation of a natural history survey of the State now in progress at the University. *Twice a week; I, II; (1 to 2 units).* *Time to be arranged.* Professor SMITH

121. Invertebrate Morphology and Parasitology.—Individual research course. *I, II; (1 to 2 units).* *Time to be arranged.* Professor WARD

122. Vertebrate Morphology.—Individual research course. *I, II; (1 to 2 units).* *Time to be arranged.* Professor KINGSLEY

123. Faunistic and Systematic Zoology.—Individual research course. *I, II; (1 to 2 units).* *Time to be arranged.* Professor SMITH

124. Experimental Zoology.—Individual research course. *I, II; (1 to 2 units).* *Time to be arranged.* Professor ZELENY

125. Animal Ecology and Behavior.—Individual research course. *I, II.* *Time and credit to be arranged.* Assistant Professor SHELFORD

B. HUMAN ANATOMY

1. Introduction to Human Anatomy.—The human skeleton; dissection of the brain of man. *I; (3).* *Time to be arranged.*

Prerequisite: Zoology 1, 2, 3, 6.

2. Introduction to Human Anatomy.—Dissection of the human extremities and the viscera of the dog. *II; (3).* *Time to be arranged.*

Prerequisite: Anatomy 1.

Learning and Labor

University of Illinois

ANNOUNCEMENT OF COURSES SEPTEMBER, 1917

DIRECTIONS FOR REGISTRATION
REQUIREMENTS FOR GRADUATION
DESCRIPTION OF COURSES

PUBLISHED BY THE UNIVERSITY
URBANA

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PRESIDENT OF THE UNIVERSITY

EDMUND JANES JAMES, Ph.D., LL.D.

¹Appointed by Governor Lowden to fill the unexpired term of Mrs. Ellen M. Henrotin, resigned.

REGISTRATION CALENDAR

1917-18

First Semester

1917

Sept. 10-14, Mon. to Fri.	Entrance examinations (get program and permit the Registrar's Office)
Sept. 17, 18, Mon., Tues.	Registration Days
Sept. 17, Mon., 7 p. m.	Examination for exemption from Rhetoric 1
Sept. 19, Wed., 8 a. m.	Instruction begun
Sept. 22, Sat.	Assignments in the Brigade posted (Engine Building, 1st floor, west end)
Sept. 24, Mon.	Military Drill (Mil. 2) and Physical Training (1 and 1a, 7 and 9) begun
Sept. 29, Sat., 12 m.	Latest date for rebates in full and for change of student list without fee
Nov. 17, Sat., 12 m.	Latest date for rebates of one-half fees

1918

Jan. 30-Feb. 2, Wed. to Sat.	Entrance examinations (get program and permit the Registrar's Office)
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Second Semester

Feb. 4, 5, Mon., Tues.	Registration Days
Feb. 6, Wed., 8 a. m.	Instruction begun
Feb. 16, Sat., 12 m.	Latest date for rebates in full and for change of student list without fee
Mar. 8, Fri.	Latest date for removal by seniors of first-semester failures
Apr. 6, Sat., 12 m.	Latest date for rebates of one-half fees

DIRECTORY OF REGISTRATION OFFICERS

Information Office.....157 Administration Building
Registrar's Office.....156 Administration Building

CHARLES MAXWELL MCCONN, A.M., *Registrar*
HARRISON EDWARD CUNNINGHAM, A.B., *Assistant Registrar*
LEVI AUGUSTUS BOICE, *Recorder*
IRA MELVILLE SMITH, LL.B., *Examiner*
GEORGE PHILIP TUTTLE, Jr., B.S., *Examiner*

NOTE: For high-school and normal-school credits, see Mr. Smith; for advanced
credits from other colleges, see Mr. Tuttle; for University of Illinois grades and credits,
see Mr. Boice.

OTHER GENERAL UNIVERSITY OFFICERS

Chief of Men
MARSH EVERETT THOMPSON.....156 Administration Building
Dean of Men
THOMAS ARKLE CLARK, B.L., *Dean*.....152 Administration Building
ARTHUR RAY WARNOCK, A.B., *Assistant Dean*...152 Administration Building
Dean of Women
FANNY COOK GATES, Ph.D.....102 Woman's Building
Advisor to Foreign Students
ARTHUR ROMEYN SEYMOUR, Ph.D.....153 Administration Building
High School Visitor
HORACE ADELBERT HOLLISTER, A.M.....253 Administration Building
Director of Physical Training for Men
GEORGE A HUFF, B.S.....1 Gymnasium
Director of Physical Training for Women
LOUISE FREER, A.B., B.S.....110 Woman's Building
Commandant
.....112 Engineering Building
Sergeant FREDERICK WILLIAM POST, U. S. A., Ret'd.,
Administrative Assistant.....112 Engineering Building

OFFICERS OF COLLEGES AND SCHOOLS

College of Liberal Arts and Sciences
KENDRIC CHARLES BABCOCK, Ph.D., LL.D., *Dean*.....304 University Hall
HOWARD VERNON CANTER, Ph.D., *Assistant Dean*.....304 University Hall
College of Commerce and Business Administration
NATHAN AUSTIN WESTON, Ph.D., *Acting Dean*.....104 Commerce Building

College of Engineering

CHARLES RUSS RICHARDS, M.E., *Dean* 300 Engineering Building
 HARVEY HERBERT JORDAN, B.S., *Assistant Dean* 300 Engineering Building

College of Agriculture

EUGENE DAVENPORT, M.Agr., LL.D., *Dean* 100 Agricultural Building
 FRED HENRY RANKIN, *Assistant to the Dean* 100 Agricultural Building

College of Law

HENRY WINTHROP BALLANTINE, LL.B., *Dean* 206 Law Building

School of Music

JOHN LAWRENCE ERB, F.A.G.O., *Director* 202 University Hall

Library School

PHINEAS LAWRENCE WINDSOR, Ph.B., *Director* 318 Library Building
 FRANCES SIMPSON, M.L., B.L.S., *Assistant Director* 320 Library Building

School of Education

..... *Director* 203 University Hall
 JOHN ALFORD STEVENSON, A.M., *Secretary* 203 University Hall

Graduate School

DAVID KINLEY, Ph.D., LL.D., *Dean* 109 Commerce Building

GENERAL DIRECTIONS FOR REGISTRATION

To Every Student:

You should at once look over the **HEADINGS**, at least, of **ALL** the paragraphs, numbered 1-29, which follow. It is certain that one or two of them, and probable that several others, are **OF VITAL IMPORTANCE** to **YOU** individually at this time.

1. New Students without Permits to Register

A new student *who has not yet secured a permit to register* should proceed at once to the Registrar's Office, 156 Administration Building, taking with him his credit statements from all former schools attended (high school, academy, normal school, or college), and make application for a permit.

EXCEPTIONS

The foregoing direction applies to all new students without permits except:

- (1) GRADUATE STUDENTS—see page 81.
- (2) LIBRARY SCHOOL STUDENTS—see page 77.
- (3) APPLICANTS FOR ADMISSION AS "SPECIAL STUDENTS"—see paragraph 12.
- (4) STUDENTS DROPPED FROM OTHER INSTITUTIONS—see paragraph 8.
- (5) FOREIGN STUDENTS—see paragraph 9.

2. New Students with Permits to Register

A new student *who has already received a permit to register* need not go to the Registrar's Office, but will receive his study-list, together with further detailed instructions, at one of the following points, according to the college or school which his permit entitles him to enter:

College of Liberal Arts and Sciences, including the Curriculums in Journalism, in Chemistry and Chemical Engineering, in Household Administration, and for Teachers of Household Science, and the Pre-Legal and Pre-Medical Curriculums—opposite the main entrance of University Hall.

College of Commerce and Business Administration—opposite the main entrance of the Commerce Building.

College of Engineering, including the Curriculum in Ceramic Engineering—Engineering Hall.

College of Agriculture, including the Curriculum in Household Science—opposite the main entrance of the Agricultural Building.

School of Music—Room 202, University Hall.

College of Law—Room 206, Law Building.

Library School—Room 320, Library Building.

Graduate School—Room 109, Commerce Building.

3. Former Students in Attendance Last Semester

A former student *in attendance the second semester of the year 1916-17*, and in all respects in good standing (see paragraph 5), should call for his study-list at one of

the points mentioned in paragraph 2, according to the college or school in which is enrolled.

4. Former Students Not in Attendance Last Semester

A former student *not in attendance the second semester of the year 1916-17*, but in all respects in good standing (see paragraph 5), must first secure a permit to re-enroll if a man, from the Dean of Men, if a woman, from the Dean of Women, and must then obtain a study-list at the Registrar's Office.

5. Former Students Not in Good Standing

A former student, whether or not in attendance the preceding semester, if *in good standing*, either—

(a) Because he has been in attendance a year as a *conditioned freshman* and has not removed his entrance conditions; or—

(b) Because he has been registered for two years as a *special student* without matriculating; or—

(c) Because he has been *dropped for poor scholarship* or *dismissed on disciplinary grounds*—may not register except on the recommendation of the faculty of the college and with the approval of the Council of Administration, evidenced by a permit from the Secretary of the Council. Such a student should go first to see the dean or the assistant dean of his college.

A former student who has withdrawn from the University within the last three weeks of his last semester of attendance may register again only with the special permission of the Dean of Men or the Dean of Women.

6. Students Changing Colleges or Curriculums within the University

A student who desires to transfer from one college or school of the University of Illinois to another college or school of the University should (1) secure from the dean or director of the college or school in which he was formerly enrolled a statement of his record therein; (2) secure from the Registrar's Office a statement of his entrance credits; and (3) submit these papers to the dean of the college or the director of the school which he wishes to enter.

Any student who wishes to transfer from the curriculum in which he was registered the last semester to another curriculum *in the same college* should consult the dean or the assistant dean of his college.

7. Students with Advanced Standing

A student transferring from another university, a college, a normal school, or a junior college, should submit his credits from that institution, or his "Estimate of Advanced Standing," if he has already obtained an "Estimate" from the Registrar, to his adviser when consulting the latter about his course. Then, whether he has already had an "Estimate" made or not, he should call between October 1 and October 15 at the Registrar's Office to file a formal petition for transfer of credits. For the rules governing such transfers see the "*Regulations for the Guidance of Undergraduate Students*," Appendix I. It is impossible for the Registrar's Office to make up estimates of advanced standing on the registration days.

Students seeking credit for previous work done elsewhere than in recognized colleges, universities, normal schools, or junior colleges may apply for special examinations for advanced standing, which, if taken within sixty days after matriculation, are given without fee.

8. Students Dropped from Other Institutions

A student who has been dropped from another college or university, either for unsatisfactory scholarship or for disciplinary reasons, may be admitted to the Uni-

of Illinois only on the recommendation of the college which he desires to enter, and by the Council of Administration. A student in this case should first see the dean or the assistant dean of the college of his choice and learn in consultation with him whether or not it is probably worth his while to file a petition.

Foreign Students

Students from foreign countries should consult first the Adviser for Foreign Students, Room 153, Administration Building.

Students Earning Their Way

Students who are making their own expenses, either in whole or in part, during school year, should state that fact to their advisers when making up their schedules. Experience has shown conclusively that such students should carry light

Persons Employed by the University

Any person in the regular employ of the University may be permitted to attend University classes for credit, provided he registers and pays a fee of \$7.50 for each semester.

Special Students

Persons over twenty-one years of age may be admitted as special students, provided they secure (1) the recommendation of the instructor whose course they intend to take, and (2) the approval of the dean of the college in which the course is offered. They must give evidence that they possess the requisite information and ability to pursue profitably, as special students, their chosen subjects, and must meet the special requirements of the particular college in which they wish to enroll. A special student is not matriculated and must pay a tuition fee of \$7.50 a semester in addition to the regular incidental fee of \$15.00 a semester.

No one may enroll as a special student in any college or school of the University more than two years, except by special permission, application for which must be made through the dean of the college.

A person registered as a special student in one college and desiring to take a course in another college of the University must obtain the approval of the dean of the latter college.

A person desiring admission as a special student should first see the dean or the assistant dean of the college he wishes to enter (see the directory on pages 7 and 8).

Deficient Freshmen

No student is admitted to the University who offers less than fifteen units of high-school work in acceptable subjects or whose fifteen units fail to include certain subjects that are *prescribed* for all the colleges and schools of the University, namely, English, 3 units; algebra, 1 unit; plane geometry, 1 unit; and laboratory science (physics, or chemistry, or zoology, or botany, or physiology, or physiography), 1 unit. A student who offers fifteen units in acceptable subjects, including the six units named above, but is deficient not more than two units in subjects prescribed in addition for the individual college or school of his choice,¹ may be admitted in that college or school to courses for which he is prepared.

A deficient freshman pays an extra fee of \$7.50 each semester.

No student having entrance deficiencies may continue in the University for a second year, except on the recommendation of the faculty of the college or school

¹For these special prescriptions for the several colleges and schools see the *Annual Register*, 1916—p. 68.

in which he is enrolled, approved by the Council of Administration. Permission to continue as a deficient student will be granted only in very exceptional cases.

A student who has been registered for one year as a deficient freshman may, with the approval of the dean of his college, be permitted to register as a special student for one year, provided (1) that his age when he registered as a deficient freshman would have permitted him to enter as a special student at that time, and (2) that his average grade during the year of his attendance has been not less than 80.

14. Exemption from Rhetoric 1 by Examination

Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 (the second semester of the freshman course in themes) may be excused from Rhetoric 1 (the first semester). An examination to test such proficiency will be given at 7:00 p. m. on the first day of registration (Monday, September 17) in room 228, Natural History Building. The results of this examination will be announced the following morning. Students who intend to try this examination should defer their registration until they learn whether or not they have passed in the examination.

15. Number of Hours¹ Prescribed

That the time of students may be fully occupied, each person is required to pursue studies aggregating *not less than fifteen nor more than eighteen hours*,¹ except that students in curriculums requiring more than such number of hours in any semester are not limited as to such required hours by this rule; and except further that a student whose standing in each study of the preceding semester has been 90 may take for the semester studies aggregating not more than twenty hours. A student may be permitted to take more or less than the amount of work prescribed above only on the permission of the dean of his college or the director of his school.

A student who cannot devote his entire time to his studies because of illness, outside work necessary to meet expenses, or other good reason, may be required by the dean of his college or the director of his school to take less than fifteen hours.

16. Required Subjects Take Precedence

Any required subject in which there is a failure must upon the first recurrence of such subject take precedence over all other subjects.

17. Credit Forfeited by Reregistering

By reregistering or taking a special examination in a subject for which he has received credit, a student forfeits his credit. When a course is thus repeated the grade given at the end of the repetition or as the result of the special examination becomes the official grade.

18. Candidacy for Graduation

Candidates for graduation must have completed by the end of the first semester of the year of graduation all studies required therefor, except those to be taken in class in the second semester; provided, that a failure in the first semester's work may be made up not later than one month after the beginning of the second semester.

19. Courses with Variable Credit

In registering for a course with variable credit hours (e. g., Agronomy 13, 3-5 hours), a student must put down on his study-list the number of hours for which he intends to take the course; e. g., not 3-5, but 3, or 4, or 5.

¹ Credit is reckoned in "semester hours," or simply "hours." An "hour" is one class period a week for one semester, each class period presupposing two hours' preparation by the student, or the equivalent in laboratory, shop, or drawing room.

20. Military and Physical Training For Men

(a) THE REQUIREMENT IN MILITARY

Under the Act of Congress of June 3, 1916 (the National Defense Act), there have been established at the University of Illinois three units of the Reserve Officers' Training Corps.

All male students admitted to the University of Illinois (except in the professional departments) who are citizens of the United States and physically fit are enrolled during their freshman and sophomore years in the Reserve Officers' Training Corps, and are required during these two years to devote three periods a week of not less than one hour each to military science and training. Two of the three periods are devoted to drill practise, and one period to theoretical training.

At the end of the sophomore year a student who so elects, who is recommended by the President of the University and approved by the Professor of Military Science and Tactics, and who signs a form of written agreement prescribed by the Secretary of War, may be enrolled for two more years of service in the Reserve Officers' Training Corps. Such students are required to devote five hours a week to an advanced course in military science and training throughout their junior and senior years, and the completion of this work becomes for them a prerequisite for graduation. They are required also to attend two summer training camps of four weeks each.

One hour of credit toward graduation is given for each semester of work in military science, making four credits for the required work of the freshman and sophomore years, and eight credits in all for students who elect the advanced course of the junior and senior years.

A student who completes the elective advanced course is eligible for appointment by the President of the United States as a reserve officer of the United States Army for a period of ten years; and is eligible, also, for appointment as a temporary second lieutenant of the Regular Army, in time of peace, for purposes of instruction, with the allowances provided by law for that grade and pay at the rate of \$100 a month for six months; on the expiration of this period of service with the Regular Army, he reverts to the status of a reserve officer.

Under these provisions all male students, citizens of the United States, except (1) students of the College of Law, (2) students over twenty-five years of age when entering the University, (3) students entering the University with junior standing, and (4) students who have had two years of military work at other institutions having a United States Army officer on duty as professor of military science, must register in military on entering the University, and, unless properly excused, must take the full course therein, whether they intend to graduate or not. To have any credits received for military work count for graduation, the full course must be taken. The classes of students excepted above may take military work if they so desire by registering for it.

After registering in the military department, students physically disqualified, such disability to be certified by a reputable physician approved by the Council of Administration, may be excused from military work by petition submitted through the Military Office.

(b) THE REQUIREMENT IN PHYSICAL TRAINING (MEN)

Freshmen take physical training throughout the year.

The Dean of Men may excuse from the required gymnasium practise such men students as are doing manual labor or present other legitimate reasons; he may also give permission to defer physical training for the current year.

(c) HOW TO REGISTER IN MILITARY AND PHYSICAL TRAINING (MEN)

First Semester

Freshmen, first semester—register for *Military 1a* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 1b* (Theoretical Instruction) and for *Physical Training 1* (Gymnasium Practise) and *1a* (Personal Hygiene)¹ as for any other sectional courses.

Sophomores, first semester—register for *Military 3a* (second-year Drill) at 4 o'clock, on Monday, Tuesday, Wednesday, and Thursday; and register for *Military 3b* (second-year Theoretical Instruction), as for any other sectional courses.

Juniors and seniors in the Reserve Officers' Training Corps, first semester—register for *Military 5a* or *7a* (third-year or fourth-year Drill) at 4 o'clock, on Monday, Tuesday, Wednesday, Thursday, and Friday; and register for *Military 5b* or *7b* (third-year or fourth-year Theoretical Instruction) as for any other sectional courses.

Second Semester

Freshmen, second semester—register for *Military 2a* (Drill) at 4 o'clock, Monday, Tuesday, Wednesday, and Thursday; and register for *Military 2b* (Theoretical Instruction) and *Physical Training 2* (Gymnasium Practise) as for any other sectional courses.

Sophomores, second semester—register for *Military 4a* (second-year Drill), at 4 o'clock on Monday, Tuesday, Wednesday, and Thursday; and register for *Military 4b* (second-year Theoretical Instruction), as for any other sectional courses.

Juniors and seniors in the Reserve Officers' Training Corps, second semester—register for *Military 6a* or *8a* (third-year or fourth-year Drill) at four o'clock on Monday, Tuesday, Wednesday, Thursday and Friday; and register for *Military 6b* or *8b* (third-year or fourth-year Theoretical Instruction) as for any other sectional courses.

(d) ASSIGNMENT TO COMPANIES

Assignment to companies in the Brigade will be made by the Commandant.

The assignments in the Brigade will be posted on the Military Bulletin Board on the first floor of Engineering Hall, west end, outside room 112, on Saturday, September 22. Military drill will begin on Monday, September 24.

(e) UNIFORMS

All students registering in Military for the first time must report *on the registration days* at Room 104, Engineering Hall, to be measured for uniforms.

A deposit of \$26.63, to cover the cost of the uniform, is required of all students registering in Military for the first time, and must be paid with the other fees at registration. This deposit pays for the following articles: coat, breeches, leggins, cap, shirt, belt, collar, tie, gloves. Cadets must provide themselves also with stout tan shoes approved by the Commandant. Shoes of suitable style and quality may be obtained from a local dealer under a contract made by the University for \$5.85.

(It is possible that the Federal government may make an allowance of from \$12 to \$15 per student toward the cost of these uniforms. If the government does this, the amount so allowed will be refunded to each student.)

21. Physical Training for Women

Freshman women have Gymnasium Practise three hours a week throughout the year, and lectures on Hygiene by the Dean of Women at 4 o'clock on Monday throughout the first semester.

¹*Physical Training 1a* (six lectures on Personal Hygiene by the Dean of Men) begins Monday, September 24, and extends through October; *Physical Training 1* (Gymnasium Practise) begins Monday, September 24, and extends throughout the semester.

For the *first semester*, they should register for *Physical Training 9* (Hygiene) at 4 o'clock on Monday; and should register for *Physical Training 7a* (Gymnasium Practise) as they would for any other sectional course.

For the *second semester*, they should register for *Physical Training 7b* (Gymnasium Practise) as they would for any other sectional course.

The Dean of Women may excuse from the required gymnasium practise such women students as are doing manual labor or present other legitimate reasons; she may also give permission to defer physical training for the current year.

22. Late Registration

A late registration fee of one dollar is charged all former students registering later than the registration days.

A student is not registered until his fees are paid. A student who pays his fees on the first day of instruction or thereafter instead of on the registration days will, therefore, be charged the late registration fee.

23. Week-Old Study-Lists Invalid

A study-list becomes invalid if not filed at the Business Office within one week after the date of its issue.

24. Changes in Study-Lists

Permission to change study-lists after registration may be obtained only from the dean of the college or the director of the school in which the student is enrolled. No changes can be made on the registration days.

Changes in study-lists must be completed and filed at the Business Office not later than 12 m. of the tenth day of class work as scheduled (in the first semester, Saturday, September 29, 1917; in the second semester, Saturday, February 16, 1918) or a fee of \$1.00 will be charged for each change; provided that the total charge for the rearrangement provided for on any one change slip shall not exceed \$2.00.

25. Listeners or Visitors

(a) *Registered Students.* Permission to attend classes as listeners or visitors is granted to registered students only with the consent of the instructor of the class and with the approval of the dean of the college or the director of the school in which the student is enrolled. *Students who visit a course as listeners are not allowed an examination for credit.*

(b) *Persons in the Employ of the University.* Permission to attend classes regularly as visitors only may be granted, without fee, to persons in the employ of the University on the recommendation of the head of the department in which the employee is at work, with the consent of the instructor in the course, and with the approval of the dean of the college in which the course is given.

(c) *Persons Not Connected with the University.* Permission to attend classes regularly as listeners only may be given to persons who are not connected with the University, on the following conditions: (1) they must first secure the consent of the instructor concerned and of the dean of the college in which the course is given; (2) they must pay a fee of \$7.50 for each course attended.

No instructor is allowed to admit any listeners or visitors to any of his classes except on presentation of a visitor's card showing that he has complied with the foregoing conditions.

Visitors' permits should not be applied for on the registration days.

26. Fees Payable in Advance

All fees are payable in advance at registration.

A student who is in debt to the University at the end of any semester is not

permitted to register in the University again, and is not entitled to receive an official statement of his credits from the Registrar, until his indebtedness has been discharged.

27. Hospital Fund

Every student should, on the registration days, join the Students' Mutual Benefit Hospital Fund. A payment of one dollar insures care in the local hospital, without hospital fees, for any period of illness not exceeding four weeks, during the semester. Apply at the office of the Dean of Men or of the Dean of Women.

28. University Honors

For information in regard to the University Honors open to students—Freshman Honors, Preliminary Honors, Special and Final Honors, and the A. B. Degree with Honors—see pp. 82, 83.

29. "Regulations"

Every student should obtain, at the office of the dean of his college or of the Dean of Men or the Dean of Women, a copy of the "*Regulations for the Guidance of Undergraduate Students*," should look it through, and should *keep it for reference*.

THE COLLEGE OF LIBERAL ARTS AND SCIENCES

I. DIRECTIONS FOR FRESHMEN

- (1) Read paragraphs 1, 2, 10, 13, 14, 15, 20, 21, 22, 27, 28, and 29, pages 9-16.
- (2) Obtain your study-list, (1) *if you already have a permit to register*, at the desk on the first floor of University Hall, opposite the main entrance; (2) *if you have not yet secured a permit to register*, at the Registrar's Office, 156 Administration Building.
- (3) Follow, *point by point*, the directions on the first coupon of the study-list.

ADVISERS

You will find the adviser who is to approve your study-list, according to the curriculum to be pursued, as designated on page 32.

STUDIES FOR FRESHMEN

The total number of hours for which any freshman registers may not be less than fifteen nor more than eighteen, including the required subjects, except by permission of the Assistant Dean, Room 304, University Hall. A student who cannot devote his entire time to his studies because of ill health, outside work necessary to meet expenses (see paragraph 10, page 11), or other good reasons, should consult with the Assistant Dean before registering.

1. *Required.*—All men who enter as freshmen must register for *Rhetoric 1*¹ (first semester) and 2 (second semester), *Military 1a* and *1b* (first semester) and *2a* and *2b* (second semester), and *Physical Training 1* and *1a* (first semester) and 2 (second semester). All women who enter as freshmen must register for *Rhetoric 1*¹ (first semester) and 2 (second semester) and for *Physical Training 7a* and 9 (first semester) and *7b* (second semester). Excuse from military or physical training may be secured for good reason *after registration* from the Dean of Men, Room 152, Administration Building, in the case of men, and from the Dean of Women, Room 102, Woman's Building, in the case of women. *For directions for registering in Military and Physical Training* see paragraphs 20 and 21, pages 13, 14). In addition to the above all freshmen (except those in the Pre-Medical Curriculum) must take *foreign language*. Freshmen whose major work is to be in one of the natural sciences and who have not had at least a one-year course in chemistry or physics in an accredited high school, should register for one or both of these subjects during the year.

2. *Elective.*—The subjects listed below are open to freshmen. *Do not register for any others.* Courses should be selected from at least *three of the five groups*, not counting art and design, household science, or library science.

Freshmen are advised not to register for more than one *beginning* course in foreign language at the same time, nor for more than two five-hour laboratory courses.

¹Except those in the Curriculums in Chemistry and Chemical Engineering.

Students who wish to continue their study of Latin in the University are strongly urged to take Greek also. The Greek and Latin classics are important as a foundation for the study of modern literature, history, philosophy, and education. Students who wish to specialize later in history and politics are advised to take *History* (first semester) and *1b* (second semester) in their freshman year.

Music.—Courses 1-14 in Music (see the Description of Courses beginning page 85) may be counted for credit in this College. Others may be taken with credit. Students wishing to enter courses in music other than 1-14 must consult the Director of the School of Music, Room 202, University Hall, and secure from a slip designating the course and the fee. This slip must be presented to the adviser. The total number of hours including music must not exceed eight. Not more than sixteen hours of regular work should be entered upon the registrar's blank of freshmen who take music.

Law.—Students planning to enter the College of Law after one or two years' study in this College take the prescribed subjects: Rhetoric, military, physical training, foreign language (preferably Latin, if two or three units have been offered for entrance; German, if one or more units of German have been offered for entrance or French, with or without entrance credit). They are advised to make up the rest of the schedule from among the following subjects: Economics, history, mathematics (see page 38 for a recommended program, also page 39 for the combined curriculum for the A.B. and LL.B. degrees). *Courses in Law may not be taken by students enrolled in this College before the junior year. Consult advisers in Room 208, University Hall.*

For the description and time-table of each of the courses named below see the Description of Courses, beginning on page 85. The courses are arranged in alphabetical order by departments.

FIRST SEMESTER

- I. English 10¹ (3)²; Rhetoric 1 (3).
- II. French 1a (4) or 2a (4); German 1 (4) or 3 (4) or 4 (4) or 5 (4); Italian 1 (3); Greek 1a (4) or 3 (3); Latin 1a (4) or 2a (4) or 6 (4); Spanish 1a (4) or 2a (3) or 3a (2).
- III. Economics 7 (3) and 26 (3); History 1a (4) or 2a (3).
- IV. Mathematics 2 (3) and 4 (2) [prerequisite: entrance algebra, 1½ units; plane geometry, 1 unit]; Chemistry 1³ (5) or 1a³ (3); Physics 7a⁴ and 5 (5).
- V. Botany 1³ (5), 4d (3); Entomology 1a (3), 1b (3), 15 (5); Geology 1 (4) or 14 (3); 35 (5); Zoology 1³ (5).
Household Science 2 (4) or 7a (2).
Library Science 12³ (2).
Art and Design 1³ (3).

SECOND SEMESTER

- I. English 11¹ (3)²; Rhetoric 2 (3).
- II. French 1b (4) or 2b (4); German 1 (4) or 3 (4) or 4 (4) or 5 (4) or 6 (4) or 7 (4) or 12 (4); Greek 1b (4), 4 (4); Italian 1b (3); Latin 1b (4) or 2b (4); Spanish 1b (4) or 2b (3) or 3b (2).

¹English 10-11 is open only to freshmen who have presented the minimum amount of English required for admission. See the Description of Courses, pages 85 ff.

²The figure immediately following the subject is the number of the course (see page 85); the figure in parenthesis indicates the number of credit hours to be secured in the course each semester.

³May be taken in either semester, but not in both.

⁴Prerequisite: Mathematics 4 (Trigonometry), which may be taken at the same time.

Economics 22 (3) and 27 (3); History 1b (4) or 2b (3).

Mathematics 6 (5); Astronomy 4 (5); Chemistry 1¹ (5) or 1a¹ (3) or 2a (5); Physics 7b² and 8b² (5).

Botany 1¹ (5), 2b (5), 3b (5), 4 (3), 4a (5), 24 (3), 27b (5); Entomology 1b (2); Geology 1 (5), 22 (3), 35 (5); Zoology 2 (5), 1¹ (5), or 16 (2).

Household Science 1 (3).

Library Science 12¹ (2).

Art and Design 1¹ (2).

DEFICIENT FRESHMEN

Deficient freshmen should see paragraph 13, page 11.

C. DIRECTIONS FOR STUDENTS OTHER THAN FRESHMEN

Read paragraphs 1-29, pages 9-16.

Students in attendance the second semester of 1916-17 and in good standing obtain their study-lists at the desk on the first floor of University Hall opposite the main entrance. Students not in college last semester or not in good standing obtain their study-lists at the desk in the Registrar's Office, University Hall, opposite the main entrance. Students not in college last semester or not in good standing obtain their study-lists at the desk in the Registrar's Office, University Hall, opposite the main entrance. Students not in college last semester or not in good standing obtain their study-lists at the desk in the Registrar's Office, University Hall, opposite the main entrance.

For advisers to approve study-lists see page 32.

Follow, *point by point*, the directions on the first coupon of the study-list.

Students who have not completed their *military* and *physical training* requirements must register for these subjects. (See pages 13, 14.)

No student may take less than fifteen hours without special permission of the Assistant Dean, Room 304, University Hall, nor more than eighteen unless the student has earned credit in each of the studies of the previous semester was at least 90.

A student who cannot devote his entire time to his studies because of ill health or outside work necessary to meet expenses, or for other good reason, should consult the Assistant Dean before registering.

Students should choose their *major subject*, indicating it on the registration coupon not later than the beginning of the *junior* year. The study-lists of all *juniors* must be made up after consultation with the departments in which the subject is chosen.

For the requirements in the various departments for *majors* and *minors* in the various departments, see the *requirements for the A.B. degree* in general courses, see the Description of Courses, beginning on page 85, under the proper subject.

Music.—For courses in music see the Description of Courses beginning on page 85, under Music. Courses 1 to 14 inclusive may be counted for credit in the *major*; also certain courses in practical music, exclusive of courses open to the *major*, to an amount not to exceed one-half of the total credit in music allowed in the *major*.

Students wishing to enter courses in Music other than courses 1-14 must consult the Director of the School of Music, Room 202, University Hall, and secure from him a slip designating the course and the fee. This slip must be presented to the class who will then add the course to the student's study-list, provided the total of hours including music does not exceed eighteen.

Courses may be taken in either semester, but not in both.

Prerequisite: Mathematics 4 (Trigonometry), which may be taken at the same time.

11. *Education*.—Students who plan to teach should see the announcement of the School of Education, page 79.

12. *Library Science*.—Students who plan to take a library curriculum after graduation from this college should consult the Recommended Preliminary Curriculum outlined by the Library School, page 77.

13. *Law*.—Courses in law may not be taken by students enrolled in this College before their junior year. Attention is called to the new four-year curriculum in the College of Law, which is open to students who have had one year of College work (30 hours).

Students who purpose to take the combined course in law and liberal arts, leading to the A.B. degree, must continue registration in this college until the degree is conferred.

Requirements for the A.B. Degree

A. *Prescribed Subjects*.—Rhetoric 1-2; Physical Training 1-2 and 1a for men; Physical Training 7a-7b and 9 for women; Military Science (4 hours) for men.

B. *Group Requirements*.—Every candidate must offer the minimum of work specified in each of the following groups:

I. *English*.—The offering in this group must include at least one semester course in literature.

II. *Foreign Languages and Literature* (exclusive of courses in translation).

If a student has offered but two units of a foreign language for entrance to the University, he must pursue the study of foreign language through two one-year courses or the equivalent. If he has offered for entrance three or more units of foreign language, he must continue the study of foreign language through one year of his college course.

Note: Candidates for the degree who have not offered Greek or Latin or French or German for entrance must offer one of these languages for graduation.

III. *History, Political and Social Science*.—History, economics, political science, sociology: 8 hours.

IV. *Mathematics and Physical Science*.—Mathematics, astronomy (courses with college mathematics as prerequisites), physics, chemistry: 8 hours.

V. Botany (including bacteriology), entomology, geology, physiology, zoology: 8 hours.

VI. Education, philosophy, psychology: 6 hours, of which 3 shall be in philosophy or psychology.

C. *Major Subjects*.—Each candidate must select some one subject as his major. A major consists of courses amounting to 20 hours chosen from among those designated by a department and approved by the faculty of the college. Such courses are to be exclusive of those elementary or beginning courses which are open to freshmen, and inclusive of some distinctly advanced work. At least five hours of the work accepted for a major must have been done in residence at this University and included within the maximum credits allowed in any one division.

The subjects at present recognized as majors in this college are: Astronomy, botany, chemistry, classics, education, economics, English, entomology, French, geology, German, Germanic languages, Greek, history, household science, Latin, mathematics, philosophy, physiology, physics, political science, psychology, Romance languages, sociology, zoology.

D. *Minor Subjects.*—Each candidate must offer, in addition to his major, a minor of 20 hours in one or more allied subjects designated by the major department and approved by the faculty of the college. *At least 8 hours must be offered in one subject.*

E. *Elective Subjects.*—

1. Not more than 40 hours in any one subject may be counted for graduation, except: (a) in special courses approved by the faculty of the college; (b) when a student is writing a thesis, he may count, in addition to the 40 hours, the hours of the course in which he does his thesis work; (c) in the department of English a student may take 40 hours in addition to Rhetoric 1-2.

Note: The total credit in Art and Design is limited to 20 hours.

2. No credit is granted in any subject unless the student pursues it for the full time required in the shortest course offered in that subject. For example, if the student elects a course which yields two hours for one semester, he must stay in the class during one semester in order to get any credit at all. *In order to secure any credit in a beginning course in a foreign language, a full year's work must be completed.*
3. A limited amount of credit toward the A.B. degree is ordinarily given for courses offered in other colleges and schools of this University, as follows:

College of Agriculture:

Agriculture Extension 1 (High School Agriculture).

Agronomy 9 (Soil Physics), 11 (Soil Biology), 12 (Soil Fertility), 22 (Plant Breeding).

Animal Husbandry 7 and 31 (Animal Nutrition), 30 (Genetics).

Dairy Husbandry 11, 12a-12b (Dairy Bacteriology).

Horticulture 9 (Forestry), 12 (Horticultural Evolution), 36 (History of Landscape Gardening), 37a (Civic Design), 42 (Landscape Design).

The total credit allowed in agricultural courses may not exceed 14 hours, except that students taking their major in entomology, may take 20 hours in the above agricultural courses with the addition of Agronomy 7 and 25, and Horticulture 1a, 1b, 2, 3, 6, and 7.

College of Commerce and Business Administration:

Accountancy 1a-1b (Principles of Accounting), 13 (Municipal Accounting).

Business Organization 1 (Business Organization), 9 (Commercial and Civic Organizations).

Business Law 1a-1b (Commercial Law,—no credit given to students in the combined arts-law curriculum).

Economics, all courses except 9, 14, 15, 32, 34.

Transportation 1 (U. S. Transportation System), 2 (Transportation Policy).

College of Engineering:

Architecture 13, 14, 15, 16 (History of Architecture), 31, 32 (Architectural Drawing).

Civil Engineering 27 and 28 or 33 and 34 (Surveying), 94 (Highway Administration).

Drawing, General Engineering 1 (Elements of Drafting), 2 (Descriptive Geometry).

Electrical Engineering 4 and 64 or 8 and 68.

Mechanical Engineering 11, 12 (Thermodynamics), 30 (Mechanics of Machinery).

Mechanics, Theoretical and Applied, all courses.

The total credit allowed in engineering courses may not exceed 24 hours.

College of Law:

A student in the College of Liberal Arts and Sciences, who earns at least 30 hours in this college, may take and count towards the A.B. degree not to exceed 30 hours of work in the College of Law, provided that not less than two courses amounting to at least five hours are taken per semester, under the advice of the Dean of the College of Law as to the courses to be taken. Courses in law may not be taken before the junior year by students enrolled in this college.

Law 14 (Carriers), 24 (Municipal Corporations), 28 (Insurance), and 34 (Public Utilities) are open to students of this college offering political science or economics as a major subject who have had a previous course in law or political science involving the study of cases.

Students who in 1916-17 had junior standing may take and count the first full year of law work for thirty hours of credit toward the A.B. degree, under the former arrangement for the combined Liberal Arts and Sciences and Law course.

Library School:

Library Science 2a-2b or 12 (Reference), 7 (History of Libraries), 9 (Book-making), 13a-13b (Public Documents).

School of Music:

The total credit allowed for courses in music may not exceed 16 hours. At least one-half the credit must be taken in courses in the history and theory of music (1-14 inclusive). Credit may be allowed in practical music for courses preceded by Music 3 and 4 and exclusive of courses open to freshmen to an amount not to exceed one-half of the total allowed any student. No credit will be allowed for courses in public school music.

Physical Training:

Not to exceed 5 semester hours for men and 7 semester hours for women.

Military Science and Tactics:

Military Science not to exceed 8 semester hours.

F. *Bachelors' Theses:* A bachelors' thesis is not generally required in this College. Students of high standing are, however, encouraged to write theses in connection with their major studies. Credit toward the degree is given for thesis work only as part of the work in some course for which the student is registered. The presentation of a thesis is specifically required of all candidates for the honor degree.

G. *Optional degree of Bachelor of Science:* Students who do major work in one of the subjects in Group IV or Group V or in Household Science, on petition to and recommendation of the faculty of this college may be graduated with the degree of B.S. instead of A.B.

III. DIRECTIONS FOR STUDENTS IN JOURNALISM

Students who are preparing to enter the *advertising* or *managerial* sides of journalistic work should enroll in the College of Commerce and Business Administration. See the directions for registration in that College, page 34.

Students who are preparing for journalistic work on the *reportorial*, *literary*, or *editorial* sides should take their major work in English. They should make up their study schedules from the following suggested curriculum. With the consent of the adviser, other courses may, for purposes of specialization, be substituted for suggested courses. A program which satisfies the group and major requirements may, for instance, be so modified in the third and fourth years as to lay emphasis on any one of the social sciences.

Students in journalism with major in English are subject to the requirements of the General Curriculum in Liberal Arts and Sciences and should follow the direction for students in the General Curriculum, using the outline below in connection with those directions. The directions for freshmen in the General Curriculum are given on pages 17, 18; those for students other than freshmen on pages 19, 20.

The adviser for students in Journalism (with major in English) will be found in Room 323a, University Hall.

Suggested Curriculum in Journalism

(Major in English)

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
<i>Prescribed Subjects</i>	Hours ¹	<i>Prescribed Subjects</i>	Hours ¹
Rhet. 1 ² —Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 1a—Military Drill.....	½	Mil. 2a—Military Drill.....	½
Mil. 1b—Military Theory.....	½	Mil. 2b—Military Theory.....	½
Total.....	5	Total.....	5
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Engl. 10—Introduction to Literature—or science.....	3 or 5	Engl. 11—Introduction to Literature—or science.....	3
Foreign language.....	4	Foreign language.....	4
Hist. 1a—Continental European History... 4		Hist. 1b—Continental European History... 4	
Lib. Sci. 12—General Reference.....	2		

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Mil. 3a—Military Drill.....	½	Mil. 4a—Military Drill.....	½
Mil. 3b—Military Theory.....	½	Mil. 4b—Military Theory.....	½
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Engl. 1—Survey of English Literature—or science.....	3	Engl. 1—Survey of English Literature—or Pol. Sci. 3—State and Local Government or Econ. 3—Money and Banking.....	3
Engl. 12—American Literature.....	2	Engl. 23—Shakespeare, or English 13, American Literature.....	3 or 2
Foreign language continued.....	4	Foreign language continued.....	4
Hist. 3a—History of United States.....	3	Hist. 3b—History of United States.....	3
Pol. Sci. 1—American National Government or Econ. 1—Principles of Economics	5	Rhet. 13—The Newspaper.....	3
Rhet. 12—News Writing.....	3		

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD AND FOURTH YEARS

Study lists for these years should be selected from the following list with regard to proper sequence:

	Hours ¹		Hours ¹
Econ. 5, or 10, or 12a—Public Finance, or Corporation Management, or Labor Problems..	3	Econ. 11, or 13, or 21—Industrial Consolidation, or Econ. Hist. of Europe, or Socialism and Social Reform.....	3 or 2
Engl. 27 and 21, or 33 or 45—History of Journalism; The Bible; or Literature from 1789 to 1837; or Modern Drama.....	2 or 3	Engl. 28 and 24 or 3 or 5—Hist. of Journalism. Victorian Period, Milton, Shakespeare	2 or 3
Hist. 21—U. S. since 1877, 26—The Latin American Colonies.....	3	Hist. 17, 27, 29—Hist. of Illinois, Latin America, The Far East.....	3 or 2
Language.....	4	Language.....	4
Philos. 1—Logic, and Philos. 9—Political Ethics, or Pol. Sci. 5—Constitutional Law	3 or 2 or 4	Philos. 2—Introduction to Philosophy.....	3
Pol. Sci. 14—Political Parties—or Pol. Sci. 4—Municipal Government.....	3	Pol. Sci. 18, or 28—Contemporary Politics.....	3 or 2
Psych. 1—Intro. to Psychology.....	3	Psych. 1—Intro. to Psychology.....	3
Rhet. 6, 15, 26, 28—Short Story, Editorials and Special Articles, Editorial Practise, Newspaper Problems.....	3	Rhet. 16, 17, 27, 29—Editorials and Special Articles, Advanced Composition, Editorial Practise, Making a Country Newspaper.....	2 or 3
Sociol. 1—Principles of Sociology.....	3	Sociol. 9—Criminology.....	3

IV. DIRECTIONS FOR STUDENTS IN THE CURRICULUM PRELIMINARY TO LAW

It is recognized by the best authorities on legal education that professional studies in law should be preceded by a thoro course in the humanities and the sciences. As a foundation for the study and practise of law, the following subjects offered by this College are of special importance: English, with special reference to composition and public speaking; Latin and French; logic; constitutional and political history; political science; economics; sociology.

By the proper selection of his studies it is possible for a prospective law student to take both the degree in arts and the degree in law in six years. During his junior and senior years a student in the College of Liberal Arts and Sciences who has earned at least 30 hours in this college may take and count toward the A.B. degree not to exceed 30 hours of credit in law. *Students are not permitted to begin this work in law until their junior year.* If the student is also a candidate for the degree of LL.B., or J.D., he must in each semester of his fourth year register both in the College of Law and in the College of Liberal Arts and Sciences.

The degree of Bachelor of Arts is conferred at the close of the fourth year of the combined course provided that all the requirements for the degree are met at that time.

Students admitted to this University from other institutions may count the above courses in law for the degree of A.B. only on condition of completing at least 30 hours' work in residence in subjects offered by the College of Liberal Arts and Sciences.

V. DIRECTIONS FOR STUDENTS IN HOUSEHOLD SCIENCE

The courses of instruction given in this department are planned to meet the needs of four classes of students: (a) those who desire a knowledge of the general principles and facts of household science; (b) those who wish to make a specialty of household science for the purpose of teaching the subject in secondary schools and

¹Semester hours. For definition, see page 85.

colleges; (c) those who wish a knowledge of the principles underlying household administration and institutional management; (d) those who are interested in work in dietetics.

The suggested courses for teachers and for institutional workers are outlined below. The first three years of the course as outlined for teachers give a scientific basis for the work of the dietitian.

Students who hold *scholarships in household science* must make this subject their major along one of the lines indicated above and take each semester at least four hours in household science or in subjects required for admission to courses in household science.

Students who major in household science must also satisfy the requirements of the General Curriculum in the College of Liberal Arts and Sciences in so far as these are not covered in the courses given below, and should follow the directions for students in the General Curriculum, using the outlines below in connection with those directions. The directions for freshmen in the General Curriculum are given on pages 17, 18, those for students other than freshmen on pages 19, 20.

The advisers for students in Household Science will be found in Room 315, University Hall, on the registration days.

Suggested Curriculum for Teachers of Household Science

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1—Inorganic Chemistry or.....	5	Chem. 2a—Inorg. Chem. and Qual. Anal.	5
Chem. 1a ² —Inorganic Chemistry.....	3	Foreign language.....	4
Foreign language.....	4	H. Sci. 1 ³ —Principles of the Selection and Preparation of Food.....	3
H. Sci. 2—Home Arch. and Sanitation.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ⁴ —Rhetoric and Themes.....	3	Phys. Tr. 7—Physical Training.....	1
Phys. Tr. 7—Physical Training.....	1		
Phys. Tr. 9—Hygiene.....	1		
Total.....	14 or 16	Total.....	16

SECOND YEAR

A. & D. 1—Free Hand Drawing.....	3	A. & D. 12—Applied Design.....	2
Chem. 13a—Agricultural Analysis.....	5	Bot. 1—General Botany or.....	
Engl. 1—Survey of English Literature.....	4	Zool. 1—General Zoology.....	5
H. Sci. 6—Economic Uses of Food.....	4	Chem. 9—Organic Chemistry.....	3
Lib. Sci. 12—General Reference.....	2	Chem. 9c—Organic Synthesis.....	2
		Engl. 2—Survey of English Literature.....	4
		H. Sci. 7—Textiles.....	2
Total.....	18	Total.....	18

¹Semester hours. For definition, see page 85.

²If Chemistry 1a is taken, a 2-hour elective must be added, with the approval of the adviser.

³Attention is called to the fact that high school physics is a prerequisite for Household Science 1.

⁴Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Hist. 1a—Continental European Hist. or Hist. 3a—History of the U. S. 4 or 3	Bact. 5—Bacteriology..... 5
H. Sci. 19—Dress Design..... 3	Hist. 1b—Continental European Hist. or Hist. 3b—History of U. S..... 4 or 3
Physiol. 4—General Physiology..... 5	H. Sci. 3—Home Decoration..... 3
	H. Sci. 5—Dietetics..... 3
	H. Sci. 12—Clothing..... 3
Total..... 11	Total..... 17
<i>Electives</i>	<i>Electives</i>
Philos. 1—Logic..... 3	Econ. 2—Principles of Economics..... 3
Psychol. 1—Introduction to Psychology..... 3	H. Sci. 14—Problems in the Preparation and Service of Food..... 3
	Philos. 2—Introduction to Philosophy..... 3
	Psychol. 2—General Psychology..... 3

FOURTH YEAR

Educ. 1—Introduction to Education..... 4	Educ. 10—Technic of Teaching..... 3
H. Sci. 4—Food and Nutrition..... 5	H. Sci. 11—Teachers' Course..... 3
H. Sci. 13—Hist. of Home Economics..... 2	Total..... 6
Total..... 11	<i>Electives</i>
<i>Electives</i>	English, Advanced
Educ. 16—Social Education..... 3	H. Sci. 10—Home Management..... 2
English Advanced	H. Sci. 17—Problems in Textiles..... 3
H. Sci. 18—Lunch Room Management..... 5	Pub. Sp. 2—Oral Expression..... 2
Pub. Sp. 1—Oral Expression..... 2	Sociol. 7—Social Problems of the Rural Com- munity..... 2
Sociol. 1—Principles of Sociology..... 3	

Suggested Curriculum in Household Administration

FIRST YEAR

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1—Inorganic Chemistry or..... 5		Chem. 2a—Inorg. Chem. and Qual. Anal..... 5	
Chem. 1a ² —Inorganic Chemistry..... 3		Foreign language..... 4	
Foreign language..... 4		H. Sci. 1 ³ —Principles of the Selection and Preparation of Food..... 3	
H. Sci. 2—Home Arch. and Sanitation..... 2		Rhet. 2—Rhetoric and Themes..... 3	
Rhet. 1 ⁴ —Rhetoric and Themes..... 3		Phys. Tr. 7b—Physical Training..... 1	
Phys. Tr. 7a—Physical Training..... 1			
Phys. Tr. 9—Hygiene..... 1		Total..... 16	
Total..... 14 or 16			

SECOND YEAR

A. & D. 1—Free Hand Drawing..... 3	A. & D. 12—Applied Design..... 2
Foreign language or English 1..... 4	Bot. 1—General Botany or..... 5
H. Sci. 6—Economic Uses of Food..... 4	Zool. 1—General Zoology..... 5
H. Sci. 7—Textiles..... 2	Foreign language or English 2..... 4
Total..... 13	Total..... 11
<i>Electives</i>	<i>Electives</i>
A. & D. 19—History of the Fine Arts..... 2	A. & D. 19—History of the Fine Arts..... 2
Chem. 13a ⁵ —Agricultural Analysis or Econ. 26 ⁶ —Economic Resources..... 5 or 3	Chem. 9 ⁵ —Organic Chemistry and..... 3
Hist. 1a—Continental European Hist. or Hist. 3a—History of the U. S..... 3 or 4	Chem. 9c—Organic Synthesis or Econ. 22 ⁶ —Econ. Hist. of U. S..... 2 or 3
Lib. Sci. 12—General Reference..... 2	Hist. 1b—Continental European Hist. or Hist. 3b—History of the U. S..... 3 or 4

¹Semester hours. For definition, see page 85.²If Chemistry 1a is taken, a 2-hour elective must be added, with the approval of the adviser.³Attention is called to the fact that high school physics is a prerequisite for Household Science 1.⁴Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.⁵Choice depends on whether the student wishes to emphasize the sciences or economics as a minor.

THIRD YEAR

Econ. 1—Principles of Economics.....	5	H. Sci. 3—Home Decoration.....	3
H. Sci. 19—Dress Design.....	3	H. Sci. 5—Dietics.....	3
Physiol. 4—General Physiology.....	5	H. Sci. 12—Clothing.....	3
Total.....	13	Total.....	9
<i>Electives</i>		<i>Electives</i>	
English		H. Sci. 10—Home Management.....	2
H. Sci. 14—Problems in the Preparation and Service of Food.....	3	Philos. 2—Introduction to Philosophy.....	3
Psychol. 1—Introduction to Psychology.....	3	Pol. Sci. 3—State and Local Government....	3
Sociol. 1—Principles of Sociology.....	3	Pol. Sci. 16—Government of Illinois.....	2
Bact. 5—Introduction to Bacteriology.....	5	Psychol. 2—General Psychology or	
		Educ. 1—Intro. to Education.....	3 or 4

FOURTH YEAR

<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Educ. 1—Introduction to Education.....	4	Educ. 10—Observation and Technic.....	3
English, Advanced		English, Advanced	
H. Sci. 4—Food and Nutrition.....	5	H. Sci. 9—Individual Problems.....	3
H. Sci. 13—History of Home Economics.....	2	H. Sci. 11—Teachers' Course.....	3
H. Sci. 15—Economics of the Family Group..	3	H. Sci. 17—Problems in the Study of Textiles	3
H. Sci. 18—Lunch Room Management.....	5	H. Sci. 18—Organism of the Household.....	3

VI. DIRECTIONS FOR STUDENTS IN SCIENCE CURRICULUMS

(Pre-Medical; Chemistry, Chemical Engineering)

1. Look over the General Directions contained in paragraphs 1-29, pages 9-16.
2. Freshmen who have already secured permits to register, and all other students who were in attendance the second semester of 1916-17 and are in good standing will obtain their study-lists at the desk on the first floor of the University Hall opposite the main entrance. Freshmen without permits, see paragraph 1, page 9. Other students not in attendance last semester or not in good standing, see paragraphs 4 and 5, page 10.
3. Report for registration to the third floor of University Hall, south end. You will find your adviser in one of the following rooms, according to the curriculum in which you are enrolling:
PRE-MEDICAL CURRICULUM—Room 310.
CURRICULUMS IN CHEMISTRY AND CHEMICAL ENGINEERING—Room 311.
4. Follow, *point by point*, the directions on the first coupon of your study-list.
5. The outlines of the several curriculums follow.

PRE-MEDICAL CURRICULUM

The One-Year Medical College at Urbana, providing opportunity for registration at Urbana for the freshman year of a four-year medical course, has been discontinued for the year 1917-18, together with the Six-Year Medical Curriculum (three years at Urbana and three at the College of Medicine in Chicago) and the Seven-Year Medical Curriculum (four years at Urbana and three in Chicago). Students who have completed their two years of pre-medical studies and desire to enter upon a medical course should enroll as freshmen in the College of Medicine in Chicago. They should correspond at as early a date as possible with Mr. W. H. Browne, Secretary of the University of Illinois College of Medicine, Congress and

Honore Streets, Chicago, Illinois. The registration day for the College of Medicine is September 27, 1917.

The requirement for admission to the College of Medicine is as follows:

- (a) Fifteen units of high school work, including English, 3 units; algebra, 1; plane geometry, 1; foreign language (Latin or Greek or French or German), 2; American history and civics, 1; electives, 7.
- (b) Sixty semester hours of collegiate credit, including physics, 8 hours; chemistry, 8; biology, 8; French or German, 6; electives, 30.

Conditions are permitted, for the year 1917-18, in collegiate French or German, 6 hours, or electives, 8 hours. No conditions are permitted in high-school subjects or in the collegiate physics, chemistry, or biology.

The following two-year pre-medical curriculum covers the entrance requirement of the College of Medicine as outlined in the preceding paragraph, and includes additional courses in science which it is considered desirable for prospective medical students to take. This course of study is recommended to students who enter the College of Liberal Arts and Sciences to prepare themselves for the study of medicine.

Suggested Pre-Medical Curriculum

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1—General Chemistry.....	5	Chem. 2a—Inorganic Chemistry.....	5
Math. 4—Trigonometry.....	2	Zool. 2—Vertebrate Zoology.....	5
Zool. 1—General Zoology.....	5	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	½
Mil. 1a—Military Drill.....	½	Mil. 2b—Military Theory.....	½
Mil. 1b—Military Theory.....	½		
Total.....	17	Total.....	15

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 9, 9c—Organic Chemistry.....	5
German 1 or 4.....	4	German 3 or 5 or 6.....	4
Physics 7a—General Physics.....	2½	Physics 7b—General Physics.....	2½
Physics 8a—Laboratory.....	2½	Physics 8b—Laboratory.....	2½
Zool. 3—Microscopical Technics.....	3	Zool. 6—Vetebrate Organogeny.....	3
Mil. 3a—Military Drill.....	½	Mil. 4a—Military Drill.....	½
Mil. 3b—Military Theory.....	½	Mil. 4b—Military Theory.....	½
Total.....	18	Total.....	18

Curriculum in Chemistry

Students who follow the General Curriculum in the College of Liberal Arts and Sciences with chemistry as a major subject are eligible for the degree of Bachelor of Arts. They should follow the directions given for freshmen on pages 17, 18, for students other than freshmen on pages 19, 20.

For the more specialized training of the chemist the following curriculum, largely prescribed, has been arranged. It requires a maximum total of 136 hours, and leads to the degree of Bachelor of Science in chemistry.

¹Semester Hours. For definition see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

Preliminary preparation in German or French equivalent to two years of high school work or one year of university work is prescribed. The total language requirement for graduation in the curriculum in chemistry, including courses offered for entrance, must be equivalent to two years of university German and one year of university French.

Students having one year of high school chemistry should register in Chemistry 1a. Students not having such preliminary work in high school should register in Chemistry 1 (5 hours) and arrange the other subjects in consultation with their adviser.

In the following schedule of courses, after the second year, there are offered certain *prescribed subjects* required of all students and in addition five *group options*, the last four of which are outlined for the purpose of affording systematic training along certain important lines of applied chemistry. The first option, A, is intended for those students who wish to place chief emphasis upon the fundamental branches of chemistry as a science and for those students who desire a combination of subjects outlined in the other four groups. Students in option A must submit to their adviser at the beginning of the junior year an outline of their proposed course of study for the junior and senior years. Approval of such an outline must be secured from the adviser before registering. At least 12 hours of the electives under option A must be in chemistry and it is recommended that they be selected as far as possible from more advanced courses in inorganic, analytic, organic, and physical chemistry. In all groups, except B, 10 hours of the electives must be taken outside of the department and must include a course in economics.

The groups provided for, with the letter used to designate each group, are as follows:

- A. General
- B. Electrochemical
- C. Industrial
- D. Food and Sanitation
- E. Physiological

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1 or 1a—Inorganic Chemistry: . . .	5 or 3	Chem. 3a—Inorganic Chemistry and Qualitative Analysis.	6
German or French.	4	German or French.	4
Math. 2—College Algebra.	3	Math. 6—Analytic Geometry.	5
Math. 4—Plane Trigonometry.	2	P. T. 2—Gymnasium.	1
Rhet. 1 ^a —Rhetoric and Themes.	3	Mil. 2a—Military Drill.	½
P. T. 1—Gymnasium.	1	Mil. 2b—Military Theory.	½
Mil. 1a—Military Drill.	½		
Mil. 1b—Military Theory.	½		
Total.	17	Total.	17

SECOND YEAR

Chem. 5a—Quantitative Analysis.	5	Chem. 5b—Advanced Analytical Chemistry	5
French or German.	4	French or German.	4
Rhet. 2—Rhetoric and Themes.	3	History 2 or 3 or English 20.	3
Phys. 1a and 3a—General Physics and Physical Measurements.	5	Phys. 1b and 3b—General Physics and Physical Measurements.	4
Mil. 3a—Military Drill.	½	Mil. 4a—Military Drill.	½
Mil. 3b—Military Theory.	½	Mil. 4b—Military Theory.	½
Total.	18	Total.	17

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2 may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Prescribed for all Groups

Chem. 14a—Organic Chemistry.....	4
Chem. 9a—Organic Synthesis and Ultimate Analysis.....	2
Chem. 92a—Journal Meeting.....	1
Math. 8a—Differential and Integral Calculus	5

Total.....12

Group Options

A.—General	
Electives.....	5
B.1—Electrochemical	
Economics 1; or Economics 2 with 3 additional hours other than Chemistry.....	5
C.—Industrial	
Chem. 65—Technical Gas and Fuel Analysis.....	2
Elective.....	2—4
D.—and E.—Food and Physiological	
Bact. 5—Introductory Bacteriology	5

Prescribed for all Groups

Chem. 14b—Principles of Organic Chemistry.	2
Chem. 9b—Organic Synthesis and Qualitative Analysis.....	2
Chem. 31—Principles of Physical Chemistry	4
Chem. 33—Physical Chemistry Laboratory.	2
Chem. 92b—Journal Meeting.....	1
Chem. 90—Inspection Trip.....	

Total.....11

Group Options

A.—General	
Electives.....	6
B.—Electrochemical	
Math. 9.....	3
E. E. 8—Electric Currents and Apparatus.....	3
E. E. 68—Electrical Engineering Laboratory.....	1—7
C.—Industrial	
E. E. 8—Electric Currents and Apparatus.....	3
E. E. 68—Electrical Engineering Laboratory.....	1
Elective.....	2—6
<i>Electives in Chemistry</i>	
D. and E.—Food and Physiological	
Chem. 15—Physiological Chemistry	5
Elective.....	2—7

FOURTH YEAR

Prescribed for all Groups

Chem. 95—History of Chemistry.....	2
Chem 11a—Research.....	3
Chem. 93a—Journal Meeting.....	1

Total.....6

Group Options

A.—General	
Electives.....	11
B.—Electrochemical	
Chem. 35—Electrochemistry.....	3
Chem. 37—Experimental Problems in Physical and Electrochemistry....	4
Phys. 4a—Electrical and Magnetic Measurements.....	2
Electives.....	2—11
C.—Industrial	
Chem. 35—Electrochemistry.....	3
Chem. 7—Metallurgy.....	3
Chem. 69—Metallurgical Laboratory and Assaying.....	2
Electives.....	3—11
D.—Food and Sanitation	
Chem. 5c—Food Analysis.....	5
Chem. 21—Qualitative Organic Analysis.....	2
Electives.....	3—10
E.—Physiological	
Chem. 15a.....	5
Electives.....	5—10

Prescribed for all Groups

Chem. 6—Chemical Technology.....	2
Chem. 11b—Research.....	7
Chem. 93b—Journal Meeting.....	1
Chem. 91—Inspection Trip.....	

Total.....11

Group Options

A.—General	
Electives.....	
B.—Electrochemical	
Philos. 1—Logic.....	3
Electives.....	2—
C.—Industrial	
Chem. 61—Industrial Laboratory....	8
Electives.....	3—
D. and E.—Food and Physiological	
Electives.....	

*Students electing Option B must register in Math. 7.

Curriculum in Chemical Engineering

The work of the technical chemist or superintendent is frequently so closely associated with mechanical and other engineering lines as to make a knowledge of these subjects essential. To meet these conditions, the following four-year curriculum in chemistry and related engineering subjects has been arranged. The degree given is that of Bachelor of Science in chemical engineering.

Preliminary preparation in German or French equivalent to two years of high school or one year of university work is prescribed. It is also advised that students intending to take this curriculum be prepared to offer mechanical drawing for entrance or arrange to take General Engineering Drawing 1 or S1.

Students having one year of high school chemistry should register in Chemistry 1a. Students not having such preliminary work in high school should register in Chemistry 1 (5 hours) and arrange the other subjects in consultation with their adviser.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1—Inorganic Chemistry.....	3 or 5	Chem. 3a—Inorganic Chemistry and Qualitative Analysis.....	6
German 4—Prose Reading.....	4	German 6—Scientific German.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Plane Trigonometry.....	2	P. T. 2—Gymnasium.....	1
P. T. 1—Gymnasium.....	1	Mil. 2a—Military Drill.....	½
Mil. 1a—Military Drill.....	½	Mil. 2b—Military Theory.....	½
Mil. 1b—Military Theory.....	½		
Total.....	14 or 16	Total.....	17

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 5b—Advanced Analytical Chemistry	5
Math. 8—Differential and Integral Calculus	5	Phys. 1b—General Physics.....	2
Phys. 1a—General Physics.....	3	Phys. 2b—Physical Measurements.....	2
Phys. 3a—Physical Measurements.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	T. and A. M. 20—Analytical Mechanics....	3
Mil. 3a—Military Drill.....	½	Mil. 4a—Military Drill.....	½
Mil. 3b—Military Theory.....	½	Mil. 4b—Military Theory.....	½
Total.....	19	Total.....	16

THIRD YEAR

Chem. 9a—Organic Synthesis and Ultimate Analysis.....	2	Chem. 9b—Organic Synthesis and Qualitative Organic Analysis.....	2
Chem. 14a—Organic Chemistry.....	4	Chem. 14b—Organic Chemistry.....	2
Chem. 92a—Journal Meeting.....	1	Chem. 31—Physical Chemistry.....	4
M. E. 75—Forge Work.....	1	Chem. 33—Physical Chemistry Laboratory.	2
M. E. 77—Foundry Work.....	2	Chem. 92b—Journal Meeting.....	1
T. and A. M. 21—Analytical Mechanics....	2	E. E. 8—Electrical Currents and Apparatus	3
T. and A. M. 25—Resistance of Materials..	4	E. E. 68—Electrical Engineering Laboratory	1
Electives, outside Chemistry ³	2	Inspection trip.....	
		Electives outside of the department ³	2
Total.....	18	Total.....	17

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

³During the third and fourth years students must elect a total of four hours in subjects other than Chemistry. If Military is elected no other electives may be taken.

FOURTH YEAR

Chem. 7—General Metallurgy and Iron and Steel.....	3
Chem. 11a—Research.....	3
Chem. 35—Electrochemistry.....	3
Chem. 65—Technical Gas and Fuel Analysis	2
Chem. 69—Assaying.....	2
Chem. 93a—Journal Meeting.....	1
M. E. 1—Steam and Air Machinery.....	3
Electives ¹	

Total.....17

Chem. 6—Chemical Technology.....	3
Chem. 11b—Research.....	6
Chem. 61—Industrial Chemical Laboratory	3
Chem. 93b—Journal Meeting.....	1
M. E. 64—Mechanical Engineering Laboratory.....	3
Inspection trip.....	
Electives ¹	

Total.....16

VII. CLASS ADVISERS

Approval of the course of study selected must be secured from the class adviser in the room and building indicated below:

1. Students in general liberal arts and sciences:

- (a) Freshmen and sophomores....Rooms 206, 207, 208, University Hall
- (b) Juniors.....Room 302, University Hall
- (c) Seniors (including all students who plan to graduate next June).....Room 308, University Hall
- (d) Specials.....Room 305, University Hall

2. *Household Science*.....Room 315, University Hall3. *Medicine*.....Room 310, University Hall4. *Chemistry and Chemical Engineering*.....Room 311, University Hall

Permanent advisers whom students are to consult during the year for advice and assistance will be announced on the bulletin boards or by mail shortly after registration.

VIII. HEADQUARTERS OF DEPARTMENTS

The headquarters of the different departments, where the heads or their representatives may be consulted during the registration period, are as follows:

U. H.=University Hall; N. H.=Natural History Hall; L. H.=Lincoln Hall; Com.=Commerce Building; P. L.=Physical Laboratory; Chem.=Chemistry Building.

Art and Design.....	Room 405 U. H.
Astronomy.....	Observatory
Bacteriology.....	Room 361 Chem.
Botany.....	Room 209 N. H.
Chemistry.....	Room 102 Chem.
Comparative Literature.....	Room 313 U. H.
Comparative Philology.....	Room 210 U. H.
Economics.....	Room 105 Com.
Education.....	Room 203 U. H.
English.....	Room 323 U. H.
Entomology.....	Room 223 N. H.
French.....	Room 309 U. H.

¹During the third and fourth years students must elect a total of four hours in subjects other than Chemistry. If Military is elected no other electives may be taken.

Geology.....	Room 232 N. H.
German.....	Room 210 U. H.
Greek.....	Room 126 L. H.
History.....	Room 414 U. H.
Household Science.....	Room 315 U. H.
Italian.....	Room 309 U. H.
Journalism (English).....	Room 323 U. H.
Latin.....	Room 126 L. H.
Mathematics, <i>freshmen</i>	Room 437 N. H.
Mathematics, <i>sophomores</i>	Room 430 N. H.
Philosophy.....	Room 119 L. H.
Physics.....	Room 203 P. L.
Physiology.....	Room 414 N. H.
Political Science.....	Room 414 U. H.
Psychology.....	Room 209 U. H.
Rhetoric.....	Room 323 U. H.
Scandinavian.....	Room 209 L. H.
Sociology.....	Room 318 L. H.
Spanish.....	Room 309 U. H.
Zoology.....	Room 301 N. H.

THE COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION

DIRECTIONS FOR REGISTRATION

1. Business students should read the headings of the paragraphs numbered 1-29 of the General Directions for Registration on pages 9-16 and follow those which apply to them.
2. *Freshmen* who have received a permit to register will obtain their study-lists at the table in the lobby on the first floor of the Commerce Building.
3. *Former business students* who were in attendance the second semester of 1916-17 and are in good standing will obtain their study-lists at the table in the lobby on the first floor of the Commerce Building.
4. Freshmen who have not received a permit to register should report at the Registrar's Office, 156 Administration Building.
5. Students not in attendance last semester, not in good standing, transferring from other colleges within the University, etc., should follow the general directions referred to in paragraph 1 above.
6. Having secured his study-list the student should follow, *point by point*, the directions on the first coupon. The *Registration Officers* for Business Students will be found in the following places:

Freshmen in Room 303, Commerce Building

Sophomores in Room 202, Commerce Building

Juniors in north end of Room 208, Commerce Building

Seniors in south end of Room 208, Commerce Building

Specials in Room 105, Commerce Building

7. Each student must secure the approval of his Registration Officer for the studies he has chosen. *This approval must be stamped on the study-list.* Each student must then report to the Chapel, 218 University Hall, for the purpose of securing approval of sections in sectional courses, making out class cards, and paying fees.

REQUIREMENTS FOR GRADUATION

I. THE NEW REQUIREMENTS—DEGREE OF BACHELOR OF SCIENCE

Students who entered the College of Commerce and Business Administration with the class of 1919 and subsequent classes will be given the degree of Bachelor of Science.

The requirements for the degree are as follows:

1. A candidate must comply with the University requirements as to residence and registration, and secure credit amounting to 130 hours, including the general University requirements of *Rhetoric 1-2, 6 hours*; and *Physical Training 1, 1a, and 2, 2 hours*, for men, and *7a-7b and 9, 3 hours*, for women; and *Military Science 1a, 2a, 3a, 4a and 1b, 2b, 3b, 4b, 4 hours*, for men. Students who elect

the Reserve Officers' Training Corps must also take *Military Science 5a, 6a, 7a, 8a and 5b, 6b, 7b, 8b, 4 hours.*

2. A candidate must secure credit in the subjects listed as *prescribed* in his chosen curriculum.
3. Of the electives allowed, 8 hours must be either in English literature or in foreign language in all curriculums, but prescribed courses in either of these subjects may be counted in meeting this requirement.
4. In the General Business Curriculum, the Curriculum in Banking, the Curriculum in Insurance, the Curriculum in Accountancy, the General Curriculum in Railway Administration, the Curriculum in Commerce and Law, and the Curriculum for Commercial and Civic Secretaries, 12 hours must be elected from the following group of subjects: History, political science, philosophy, psychology, and sociology, provided that not less than six hours in any one subject may be counted in fulfilling this requirement; but prescribed courses in any of these subjects may be counted in meeting the requirement.
5. Ten hours must be elected from the following group of subjects: Chemistry, mathematics, and physics, provided that not less than 5 hours in any one subject may be counted in fulfilling this requirement; but prescribed courses in any of these subjects may be counted in meeting the requirement.
6. Free electives sufficient to make up the 130 hours required for graduation may be selected from any department of the University. Such electives must, however, be chosen with a view to promoting the specific object of the curriculum pursued and must have the approval of the Dean of the College.

II. THE OLD REQUIREMENTS—DEGREE OF BACHELOR OF ARTS

The graduation requirements for former students in the Curriculum in Business Administration will remain as they have been in the past and such students will be given the degree of Bachelor of Arts.

The requirements are as follows:

1. Credit amounting to 130 hours, including the prescribed Rhetoric, Physical Training, and Military.
2. At least 8 hours in each of the following groups of subjects:
 - I. English language and literature, including rhetoric.
 - II. Latin, Greek, French, German, Italian, Spanish.
 - III. History, economics, sociology, and political science.
 - IV. Mathematics, education, philosophy, and psychology.
 - V. Astronomy, botany, chemistry, entomology, geology, physiology, physics, and zoology.
3. Credit in the following subjects:
 - I. Six hours of freshman economics (Economics 7, 22, 26, and 27). In case of students transferring from other colleges with advanced standing this requirement may be modified to suit the individual needs.
 - II. Principles of Economics (Economics 1).
 - III. Business Writing (Rhetoric 10).
 - IV. Principles of Accounting (Accountancy 1a-1b).
 - V. Commercial Law (Business Law 1a-1b).

4. A major of 24 hours in economics, but not more than six hours of freshman economics (Economics 7, 22, 26, and 27) may be counted towards the major. Courses in accountancy and business law may not be counted towards the major.

NOTE.—The outlines of the curriculums on the following pages must be used in connection with the foregoing statement of requirements and attention given to the additional subjects prescribed in the fourth year under the old requirements for graduation.

THE CURRICULUMS

The curriculums in commerce and business administration are now in process of transition as a result of the reorganization of the former *Courses in Business Administration* as the *College of Commerce and Business Administration*. The outlines which follow show the complete curriculums under the new requirements for graduation and the fourth year under the old requirements for graduation.

The subjects listed in each curriculum under the new requirements are prescribed for graduation. Sufficient electives must be taken each semester to make up a minimum of 15 hours, but not to exceed a maximum of 18 hours of work. In choosing electives the attention of students is called to provisions 3, 4, and 5 of the new requirements for graduation. It is advisable that the electives there mentioned be taken as far as possible in the first two years in order to leave more opportunity for free electives in the last two years.

General Business Curriculum

Under the New Requirements for Graduation

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 1a—Principles of Accounting.....	3	Acc'y 1b—Principles of Accounting.....	3
Econ. 26—Economic Resources.....	3	Econ. 22—Economic History of the United States.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Electives.....	4-7	Electives.....	4-7
Total.....	15-18	Total.....	15-18

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 2a—Advanced Accounting and Auditing.....	3	Acc'y 2b—Advanced Accounting and Auditing.....	3
Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Rhet. 10—Business Writing.....	2	Mil. 4a—Military Drill.....	$\frac{1}{2}$
Mil. 3a—Military Drill.....	$\frac{1}{2}$	Mil. 4b—Military Theory.....	$\frac{1}{2}$
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Electives.....	8-11
Electives.....	4-7		
Total.....	15-18	Total.....	15-18

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Bus. Org. and Op. 1—Business Organization and Operation.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Law 1a—Commercial Law.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution.....	2
Econ. 28—Domestic Commerce.....	3	Econ. 10—Corporation Management and Finance.....	3
Trans. 1—Transportation System of the United States.....	3	Rhet. 22—Summarizing and Briefing....	2
Electives.....	3-6	Trans. 12—Freight Shipment.....	2
		Electives.....	3-6
<hr/>		<hr/>	
Total.....	15-18	Total.....	15-18

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship.....	2	Bus. Org. and Op. 8—Advertising.....	2
Econ. 5—Public Finance.....	3	Econ. 31—Organization of Foreign Commerce.....	3
Electives.....	10-13	Electives.....	10-13
<hr/>		<hr/>	
Total.....	15-18	Total.....	15-18

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
<hr/>		<hr/>	
Total.....	3	Total.....	3
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Acc'y 2a—Advanced Accounting and Auditing.....	3	Acc'y 2b—Advanced Accounting and Auditing.....	3
Bus. Org. and Op. 7—Salesmanship.....	3	Bus. Org. and Op. 4—Industrial Organization and Management.....	2
Econ. 4—Financial History of U. S.....	3	Bus. Org. and Op. 8—Advertising.....	3
Econ. 12a—Labor Problems.....	3	Econ. 12b—Labor Problems.....	3
Philos. 9—Political and Social Ethics....	3		

Curriculum for Commercial and Civic Secretaries

Under the New Requirements for Graduation

The first and second years of this curriculum are the same as in the General Business Curriculum except that Political Science 1—American Government (3)—is prescribed in the first semester of the second year, while Rhetoric 10—Business Writing (2)—is transferred to the second semester.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Bus. Org. and Op. 1—Business Organization and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	2
Econ. 28—Domestic Commerce.....	3	Econ. 10—Corporation Management and Finance.....	3
Pol. Sci. 4—Municipal Government.....	3	Rhet. 22—Summarizing and Briefing....	2
Sociol. 8—Charities.....	3	Trans. 12—Freight Shipment.....	2
Electives.....	3-6	Electives.....	6-9
<hr/>		<hr/>	
Total.....	15-18	Total.....	15-18

¹Semester hours. For definition, see page 85.

FOURTH YEAR

Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Econ. 5—Public Finance.....	3	Bus. Org. and Op. 8—Advertising.....	2
Electives.....	9-12	Bus. Org. and Op. 9—Commercial and Civic Organizations.....	1
		Hort. 10b—Town Improvement.....	2
		Electives.....	7-10
Total.....	15-18	Total.....	15-18

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Org. and Op. 7—Salesmanship.....	2	Bus. Org. and Op. 4—Industrial Organiza- tion and Management.....	2
		Bus. Org. and Op. 9—Commercial and Civic Organizations.....	1
		Bus. Org. and Op. 8—Advertising.....	2
		Trans. 12—Freight Shipment.....	2
Total.....	5	Total.....	10
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Econ. 12a—Labor Problems.....	3	Econ. 21—Socialism and Economic Reform.....	2
Econ. 11—Industrial Consolidations.....	3	Econ. 12b—Labor Problems.....	3
Sociol. 10—Population.....	3	Sociol. 9—Criminology.....	3
Trans. 1—Transportation System.....	3		

Curriculum in Banking

Under the New Requirements for Graduation

The first and second years are the same as in the General Business Curriculum except that Mathematics 2—College Algebra (3)—is prescribed in the first semester of the first year.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Bus. Org. and Op. 1—Business Organiza- tion and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution.....	2
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Econ. 5—Public Finance.....	3	Econ. 10—Corporation Management and Finance.....	3
Econ. 28—Domestic Commerce.....	3	Math. 23—Mathematics of Investment...	3
Electives.....	3-6	Electives.....	4-7
Total.....	15-18	Total.....	15-18

FOURTH YEAR

Econ. 9—Practical Banking.....	2	Econ. 8—The Money Market.....	2
Econ. 4—Financial History of the United States.....	3	Econ. 31—Organization of Foreign Com- merce.....	3
Electives.....	10-13	Electives.....	10-13
Total.....	15-18	Total.....	15-18

¹Semester hours. For definition, see page 85.

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Econ. 4—Financial History of United States.....	3	Econ. 8—The Money Market.....	2
Econ. 9—Practical Banking.....	2		
Total.....	8	Total.....	5
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Acc'y 2a—Advanced Accounting and Auditing.....	3	Acc'y 2b—Advanced Accounting and Auditing.....	3
Econ. 12a—Labor Problems.....	3	Bus. Org. and Op. 4—Industrial Organization and Management.....	2
Econ. 33—Economics of Insurance.....	2	Econ. 12b—Labor Problems.....	3
Philos. 9—Political and Social Ethics....	3	Econ. 34—Property Insurance.....	2

Curriculum in Insurance

Under the New Requirements for Graduation

FIRST YEAR

FIRST SEMESTER

Hours¹

Acc'y 1a—Principles of Accounting.....	3
Econ. 26—Economic Resources.....	3
Math. 2—College Algebra.....	3
Math. 4—Trigonometry.....	2
Rhet. 1 ² —Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1
Mil. 1a—Military Drill.....	½
Mil. 1b—Military Theory.....	½
Electives.....	0-2

Total.....16-18

SECOND SEMESTER

Hours¹

Acc'y 1b—Principles of Accounting.....	3
Econ. 22—Economic History of the United States.....	3
Math. 6—Analytic Geometry.....	5
Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	½
Mil. 2b—Military Theory.....	½
Electives.....	0-2

Total.....16-18

SECOND YEAR

Acc'y 2a—Advanced Accounting and Auditing.....	3	Acc'y 2b—Advanced Accounting and Auditing.....	3
Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Math. 8—Differential and Integral Calculus.....	5	Rhet. 10—Business Writing.....	2
Mil. 3a—Military Drill.....	½	Mil. 4a—Military Drill.....	½
Mil. 3b—Military Theory.....	½	Mil. 4b—Military Theory.....	½
Electives.....	1-4	Electives.....	6-9

Total.....15-18

Total.....15-18

THIRD YEAR

Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Org. and Op. 1—Business Organization and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution.....	2
Econ. 5—Public Finance.....	3	Econ. 10—Corporation Management and Finance.....	3
Econ. 28—Domestic Commerce.....	3	Math. 23—Mathematics of Investment... ..	3
Electives.....	3-6	Electives.....	4-7

Total.....15-18

Total.....15-18

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship.....	2	Bus. Org. and Op. 8—Advertising.....	2
Econ. 33—Economics of Insurance.....	2	Econ. 34—Property Insurance.....	2
Econ. 9—Practical Banking.....	2	Math. 31—Actuarial Theory.....	3
Math. 31—Actuarial Theory.....	3	Electives.....	8-11
Electives.....	6-9		
Total.....	15-18	Total.....	15-18

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

Prescribed Subjects

Bus. Law 1a—Commercial Law.....	3
Econ. 33—Economics of Insurance.....	2
Total.....	5

Suggested Electives

Bus. Org. and Op. 7—Salesmanship.....	2
Econ. 4—Financial History of United States.....	3
Econ. 9—Practical Banking.....	2
Econ. 12a—Labor Problems.....	3
Philos. 9—Political and Social Ethics....	3

Prescribed Subjects

Bus. Law 1b—Commercial Law.....	3
Econ. 34—Property Insurance.....	2
Total.....	5

Suggested Electives

Bus. Org. and Op. 4—Industrial Organization and Management.....	2
Bus. Org. and Op. 8—Advertising.....	2
Econ. 8—Money Market.....	2
Econ. 12b—Labor Problems.....	3

Curriculum in Accountancy

Under the New Requirements for Graduation

The first and second years are the same as in the General Business Curriculum except that Mathematics 2—College Algebra (3)—is prescribed in the first semester of the first year.

THIRD YEAR

FIRST SEMESTER

Hours¹

Acc'y 3a—Accounting Problems and Auditing.....	3
Bus. Law 1a—Commercial Law.....	3
Bus. Org. and Op. 1—Business Organization and Operation.....	3
Econ. 28—Domestic Commerce.....	3
Electives.....	3-6

Total..... 15-18

SECOND SEMESTER

Hours¹

Acc'y 3b—Accounting Problems and Auditing.....	3
Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	2
Bus. Law 1b—Commercial Law.....	3
Econ. 10—Corporation Management and Finance.....	3
Math. 23—Mathematics of Investment...	3
Electives.....	1-4

Total..... 15-18

FOURTH YEAR

Acc'y 5a—C. P. A. Problems.....	2
Econ. 9—Practical Banking.....	2
Econ. 11—Industrial Consolidations....	3
Electives.....	6-9

Total..... 15-18

Acc'y 5b—C. P. A. Problems.....	2
Electives.....	13-16

Total..... 15-18

¹Semester hours. For definition, see page 85.

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

<i>Prescribed Subjects</i>	
Acc'y 3a—Accounting Problems and Auditing.....	3
Bus. Law 1a—Commercial Law.....	3
Total.....	6

<i>Suggested Electives</i>	
Econ. 11—Industrial Consolidation.....	3
Econ. 9—Practical Banking.....	2
Econ. 12a—Labor Problems.....	3
Philos. 9—Political and Social Ethics....	3

<i>Prescribed Subjects</i>	
Acc'y 3b—Accounting Problems and Auditing.....	3
Bus. Law 1b—Commercial Law.....	3
Total.....	6

<i>Suggested Electives</i>	
Bus. Org. and Op. 4—Industrial Organization and Management.....	2
Econ. 8—Money Market.....	2
Econ. 12b—Labor Problems.....	3

Curriculum in Railway Administration

Under the New Requirements for Graduation

The first year of this curriculum is the same as the first year of the Curriculum of Insurance.

SECOND YEAR

FIRST SEMESTER		Hours ¹
Acc'y 2a—Advanced Accounting and Auditing.....		3
Econ. 1—Principles of Economics.....		5
Rhet. 10—Business Writing.....		2
Trans. 7—Railway Organization.....		2
Mil. 3a—Military Drill.....		½
Mil. 3b—Military Theory.....		½
Electives.....		2-5
Total.....		15-18

SECOND SEMESTER		Hours ¹
Acc'y 2b—Advanced Accounting and Auditing.....		3
Econ. 3—Money and Banking.....		3
Trans. 12—Freight Shipment.....		2
Mil. 4a—Military Drill.....		½
Mil. 4b—Military Theory.....		½
Electives.....		6-9
Total.....		15-18

THIRD YEAR

Bus. Org. and Op. 1—Business Organization and Operation.....	3
Bus. Law 1a—Commercial Law.....	3
Trans. 1—Transportation System of the United States.....	3
Trans. 13—Railway Traffic Administration or	
Trans. 17—Railway Terminal Management.....	3
Electives.....	3-6
Total.....	15-18

Bus. Law 1b—Commercial Law.....	3
Trans. 2—Transportation Policy in Europe and the United States.....	3
Trans. 22—Railway Train Service or	
Trans. 26—Economics of Railway Location and Maintenance.....	3
Electives.....	6-9
Total.....	15-18

FOURTH YEAR

Econ. 12a—Labor Problems.....	3
Econ. 28—Domestic Commerce.....	3
Trans. 17—Railway Terminal Management or	
Trans. 13—Railway Traffic Administration.....	3
Electives.....	6-9
Total.....	15-18

Econ. 10—Corporation Management and Finance.....	3
Econ. 12b—Labor Problems.....	3
Trans. 26—Economics of Railway Location and Maintenance or	
Trans. 22—Railway Train Service.....	3
Electives.....	6-9
Total.....	15-18

¹Semester hours. For definition, see page 85.

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

Acc'y 3a—Accounting Problems and Auditing.....	3	Acc'y 3b—Accounting Problems and Auditing.....	3
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Trans. 13—Railway Traffic Administration or		Trans. 26—Economics of Railway Location and Maintenance or	
Trans. 17—Railway Terminal Management.....	3	Trans. 22—Railway Train Service.....	3
Trans. 35a—Thesis.....	2	Trans. 35b—Thesis.....	2
Electives.....	4-7	Electives.....	4-7
Total.....	15-18	Total.....	15-18

Curriculum in Railway Transportation

Under the New Requirements for Graduation

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 1a—Principles of Accounting.....	3	Acc'y 1b—Principles of Accounting.....	3
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Rhet. 2—Rhetoric and Themes.....	3
Math. 4—Trigonometry.....	2	Math. 6—Analytic Geometry.....	5
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	½
Mil. 1a—Military Drill.....	½	Mil. 2b—Military Theory.....	½
Mil. 1b—Military Theory.....	½	Electives.....	0-1
Electives.....	0-1		
Total.....	17-18	Total.....	18

SECOND YEAR

Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Math. 8—Differential and Integral Calculus.....	5	Physics 1b—General Physics.....	2
Physics 1a—General Physics.....	3	Physics 3b—Physical Measurements.....	2
Physics 3a—Physical Measurements.....	2	Rhet. 10—Business Writing.....	2
Trans. 7—Railway Organization.....	2	Trans. 12—Freight Shipment.....	2
Mil. 3a—Military Drill.....	½	T. and A. M. 20—Analytical Mechanics..	3
Mil. 3b—Military Theory.....	½	Mil. 4a—Military Drill.....	½
		Mil. 4b—Military Theory.....	½
		Electives.....	0-3
Total.....	18	Total.....	15-18

THIRD YEAR

Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Org. and Op. 1—Business Organization and Operation.....	3	C. E. 76—Surveying.....	2
Trans. 1—Transportation System of the United States.....	3	M. E. 2—Steam Engineering.....	3
Trans. 13—Railway Traffic Administration or		Trans. 2—Transportation Policy in Europe and the United States.....	3
Trans. 17—Railway Terminal Management.....	3	Trans. 22—Railway Train Service or	
Electives.....	3-6	Trans. 26—Economics of Railway Location and Maintenance.....	3
		Electives.....	1-4
Total.....	15-18	Total.....	15-18

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

FOURTH YEAR

Econ. 12a—Labor Problems.....	3	E. E. 12—Alternating Current Apparatus... 3	
E. E. 11—Direct Current Apparatus.....	3	E. E. 62—Alternating Current Laboratory... 1	
E. E. 61—Direct Current Laboratory....	1	Econ. 10—Corporation Management and Fin-	
M. E. 61—Power Measurement.....	2	ance or	
Trans. 17—Railway Terminal Manage-		Econ. 12b—Labor Problems.....	3
ment or		Trans. 26—Economics of Railway Location	
Trans. 13—Railway Traffic Administra-		and Maintenance or	
tion.....	3	Trans. 22—Railway Train Service.....	3
Electives.....	3-6	Electives.....	5-8
Total.....	15-18	Total.....	15-18

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

Acc'y 1a—Principles of Accounting.....	3	Acc'y 1b—Principles of Accounting.....	3
Econ. 12a—Labor Problems.....	3	C. E. 76—Surveying.....	2
E. E. 11 and 61—Direct Current.....	4	Econ. 12b—Labor Problems.....	3
M. E. 62—Mechanical Engineering.....	3	E. E. 12 and 62—Alternating Current... 4	
Trans. 17—Railway Terminal Manage-		Trans. 26—Economics of Railway Loca-	
ment or		tion and Maintenance or	
Trans. 13—Railway Traffic Administra-		Trans. 22—Railway Train Service.....	3
tion.....	3	Trans. 35b—Thesis.....	2
Trans. 35a—Thesis.....	2		
Total.....	18	Total.....	17

Curriculum for Commercial Teachers

Under the New Requirements for Graduation

The first and second years are the same as in the General Business Curriculum except that foreign language is prescribed in the first year, and Psychology 1—Introduction to Psychology (3), and Psychology 2—General Psychology (3)—in the second year.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Org. and Op. 1—Business Organiza-		Econ. 10—Corporation Management and	
tion and Operation.....	3	Finance.....	3
Educ. 1—Introduction to Education.....	4	Educ. 2—History of Education.....	5
Pol. Sci. 1—American Government.....	3	Pol. Sci. 3—State and Local Government..	3
Trans. 1—Transportation System of the		Trans. 12—Freight Shipment.....	2
United States.....	3	Electives.....	2-5
Electives.....	0-2		
Total.....	16-18	Total.....	15-18

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship.....	2	Bus. Org. and Op. 8—Advertising.....	2
Econ. 28—Domestic Commerce.....	3	Econ. 29—Foreign Commerce or	
Educ. 15—Social Education.....	3	Econ. 31—Organization of Foreign Com-	
Electives.....	7-10	merce.....	3
		Educ. 10—The Technic of Teaching.....	3
		Electives.....	7-10
Total.....	15-18	Total.....	15-18

¹ Semester hours. For definition, see page 85.

Under the Old Requirements for Graduation

FOURTH YEAR FOR THE CLASS OF 1918

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Econ. 12a—Labor Problems.....	3	Econ. 12b—Labor Problems.....	3
Educ. 10—Observation and Technic of Teaching.....	3	Educ. 16—Social Education or Educ. 15—School Hygiene.....	2 or 3
Total.....	9	Total.....	8 or 9
<i>Suggested Electives</i>		<i>Suggested Electives</i>	
Acc'y 2a—Advanced Accounting and Auditing.....	3	Acc'y 2b—Advanced Accounting and Auditing.....	3
Econ. 4—Financial History of United States.....	3	Bus. Org. and Op. 4—Industrial Organization and Management.....	2
Econ. 9—Practical Banking.....	2	Econ. 8—The Money Market.....	2
Philos. 9—Political and Social Ethics....	3	Econ. 21—Socialism and Economic Reform.....	2
		Trans. 12—Freight Shipment.....	2

Curriculum in Foreign Commerce

Under the New Requirements for Graduation

The first and second years of this curriculum are the same as in the General Business Curriculum except that foreign language is prescribed throughout both years.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Bus. Law 1a—Commercial Law.....	3	Bus. Law 1b—Commercial Law.....	3
Bus. Org. and Op. 1—Business Organization and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	2
Econ. 28—Domestic Commerce.....	3	Econ. 29—Foreign Commerce.....	3
Foreign Language.....	2 or 3	Econ. 10—Corporation Management and Finance.....	3
Hist. 3a—History of the United States...	3	Foreign Language.....	2 or 3
Electives.....	0-3	Hist. 3b—History of the United States...	3
		Electives.....	0-1
Total.....	15-18	Total.....	17-18

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship.....	2	Econ. 8—The Money Market.....	2
Econ. 9—Practical Banking.....	2	Econ. 31—Organization of Foreign Commerce.....	3
Advanced History.....	3	Pol. Sci. 7—American Diplomacy.....	3
Pol. Sci. 6—International Law.....	3	Advanced History.....	3
Electives.....	5-8	Electives.....	4-7
Total.....	15-18	Total.....	15-18

Industrial Administration

Under the New Requirements for Graduation

The following curriculum is intended to meet the needs of commerce students planning to enter the administrative or selling departments of industrial plants. To the usual courses in economics, accounting, etc., are added certain groups of technical courses offered by other colleges of the University. For the present

¹Semester hours. For definition, see page 85.

four such groups have been arranged, as follows: Group A, for those interested in the machine industries; Group B, the electrical industries; Group C, the building trades; Group D, the chemical industries. The student may select such one of these groups as will be most advantageous to him in his future work, but is required to take all the courses listed in the chosen group. The student electing the chemical industries group is required to take Econ. 26—Economic Resources (3) and Econ. 22—Economic History of the United States (3), instead of G. E. D. 1—Elements of Drafting (4) and G. E. D. 2—Descriptive Geometry (4), in the first year; and Chem. 1 or 1a—Inorganic Chemistry (5 or 3), instead of Economics 22—Economic History of the United States (3) and T. and A. M. 20—Analytical Mechanics (3), in the second year.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 1a—Principles of Accounting.....	3	Acc'y 1b—Principles of Accounting.....	3
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Electives.....	0 or 2
Electives.....	0-1		
Total.....	17-18	Total.....	17-18

SECOND YEAR

Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Math. 8—Differential and Integral Calculus.....	5	Econ. 23—Statistics.....	3
Phys. 1a—General Physics.....	3	Phys. 1b—General Physics.....	2
Phys. 3a—Physical Measurements.....	2	Phys. 3b—Physical Measurements.....	2
Rhet. 10—Business Writing.....	2	Econ. 22—Economic History of the United States.....	3
Mil. 3a—Military Drill.....	$\frac{1}{2}$	T. and A. M. 20—Analytical Mechanics..	3
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
		Mil. 4b—Military Theory.....	$\frac{1}{2}$
		Electives.....	0-1
Total.....	18	Total.....	17-18

THIRD YEAR

Bus. Org. and Op. 1—Business Organization and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	2
Bus. Law 1a—Commercial Law.....	3	Bus. Law 2b—Commercial Law.....	3
Trans. 1—Transportation System of the United States.....	3	Trans. 12—Freight Rates.....	2
Prescribed Technical courses, Group A, B, C, or D.....	2-6	Prescribed Technical Courses, Group A, B, C, or D.....	3-6
Electives.....	0-7	Electives.....	2-8
Total.....	15-18	Total.....	15-18

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

FOURTH YEAR

Bus. Org. and Op. 7—Salesmanship.....	2	Bus. Org. and Op. 8—Advertising.....	
Econ. 12a—Labor Problems, or Electives.....	3	Econ. 12b—Labor Problems or	
Prescribed Technical Courses, Group A,		Econ. 10—Corporation Management and	
B, C, or D.....	3-9	Finance.....	3
Electives.....	0-7	Prescribed Technical Courses, Group A,	
		B, C, or D.....	2-10
		Electives.....	0-11
Total.....	16-18	Total.....	17-18

Optional Groups of Technical Courses

GROUP A:

THIRD YEAR

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
T. and A. M. 21—Analytical Mechanics..	2	M. E. 75—Forge Work.....	1
		M. E. 77—Foundry Work.....	2
		M. E. 2—Steam Engineering.....	3

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
M. E. 61—Power Measurement.....	2	E. E. 12—Alternating Current Apparatus	3
M. E. 81—Machine Work.....	3	E. E. 62—Alternating Current Laboratory	1
E. E. 11—Direct Current Apparatus....	3		
E. E. 61—Direct Current Laboratory....	1		

GROUP B:

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
T. and A. M. 21—Analytical Mechanics..	2	M. E. 2—Steam Engineering.....	3

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
M. E. 61—Power Measurement.....	2	E. E. 12—Alternating Current Apparatus	3
E. E. 11—Direct Current Apparatus....	3	E. E. 62—Electrical Engineering Labora-	
E. E. 61—Electrical Engineering Labora-		tory.....	1
tory.....	1	E. E. 90—Lighting.....	1

GROUP C:

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Arch. Eng. 43—Working Drawings.....	2	T. and A. M. 26—Analytical Mechanics	
T. and A. M. 25—Resistance of Materials	4	and Hydraulics.....	4
		Arch. Eng. 44—Working Drawings.....	2

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
Arch. Eng. 45—Graphic Statics.....	3	C. E. 76—Surveying.....	2

GROUP D:

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Chem. 2a—Inorganic Chemistry and		Chem. 5a—Elementary Quantitative An-	
Qualitative Analysis.....	5	alysis.....	5

¹Semester hours. For definition, see page 85.

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
Chem. 9c—Organic Synthesis.....	2	Chem. 6—Chemical Technology.....	
Chem. 14a—Organic Chemistry.....	4	Chem. 31—Elementary Physical Chemis-	
Chem. 92a—Journal Meeting.....	1	try.....	
		Chem. 33—Elementary Physical Chemis-	
		try.....	
		Chem. 92b—Journal Meeting.....	

Curriculum in Commerce and Law

(A six-year combined curriculum)

Under the New Requirements for Graduation

The following curriculum is provided for students who wish to combine commercial and legal studies and secure both the degree of Bachelor of Science and the degree of Bachelor of Laws or of Doctor of Law in six years. Students who elect this curriculum must meet all the requirements for graduation from the College of Commerce and Business Administration, but in exercising their privileges of election are urged to select as many hours as possible from the following subjects: Hist. 2a-2b, English History (6); Hist. 3a-3b, United States History (6); Hist. 4a-4b, English Constitutional History (6); Pol. Sci. 1, American Government (3); and Pol. Sci. 3, State and Local Government (3). Students expecting to study law should devote at least 12 hours to work in history and political science. A course in English history is regarded as one of the most essential pre-legal subjects. The law courses in the curriculum may be taken only in the fourth year, and are counted for 30 hours of credit towards the degree, instead of hour for hour, provided the full year's work is completed. In their fourth year students will be regularly registered in the College of Law, but must file copies of their study-lists in the office of the Dean of the College of Commerce and Business Administration at the beginning of each semester.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Acc'y 1—Principles of Accounting.....	3	Acc'y 1b—Principles of Accounting.....	3
Econ. 26—Economic Resources.....	3	Econ. 22—Economic History of the United	
Rhet. 1 ^a —Rhetoric and Themes.....	3	States.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hy-		Rhet. 2—Rhetoric and Themes.....	3
giene.....	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Electives.....	4-7	Electives.....	4-7
Total.....	15-18	Total.....	15-18

SECOND YEAR

Acc'y 2—Advanced Accounting and Aud-		Acc'y 2b—Advanced Accounting and Aud-	
iting.....	3	iting.....	3
Econ. 1—Principles of Economics.....	5	Econ. 3—Money and Banking.....	3
Rhet. 10—Business Writing.....	2	Philos. 1—Logic.....	3
Mil. 3a—Military Drill.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4b—Military Theory.....	$\frac{1}{2}$
Electives.....	4-7	Electives.....	5-8
Total.....	15-18	Total.....	15-18

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Bus. Org. and Op. 1—Business Organization and Operation.....	3	Bus. Org. and Op. 2—Organization and Control of Mercantile Distribution....	2
Econ. 5—Public Finance.....	3	Econ. 10—Corporation Finance.....	3
Econ. 28—Domestic Commerce.....	3	Electives.....	10-13
Electives.....	6-9		
Total.....	15-18	Total.....	15-18

FOURTH YEAR

Law 1a—Contracts.....	4	Law 1b—Contracts.....	3
Law 2a—Torts.....	3	Law 2b—Torts.....	3
Law 5—Criminal Law.....	4	Law 3—Real Property.....	3
Law 6—Personal Property.....	2	Law 7—Domestic Relations.....	2
Law 37—Introduction to Study of Law..	1	Law 11—Agency.....	3
<hr/>		<hr/>	
Total.....	14	Total.....	14

THE COLLEGE OF ENGINEERING

Engineering students should read the General Directions for Registration given in paragraphs 1-29 on pages 9-16. They should report for registration to Engineering Hall, where further special directions will be furnished them.

GENERAL ENGINEERING LECTURES FOR FRESHMEN

One general lecture sufficiently popular in character to interest and inspire young students will be given each week. All freshman students in engineering are required to attend this lecture.

SUMMER READING

All engineering students not graduates of a college of liberal arts and sciences are required to complete prescribed courses of reading of a non-professional character during the summer vacations following the freshman and sophomore years. A circular on summer reading is issued, containing a list of books from which the student may choose. A statement of the books read during the summer is required at the beginning of the next college year.

TRIPS OF INSPECTION

An inspection trip is one of the regular requirements in the senior year of the curriculums leading to the degree of Bachelor of Science in architecture, architectural engineering, ceramic engineering, electrical engineering, mechanical engineering, mining engineering, municipal and sanitary engineering, and railway engineering.

The time required for these trips is three or four days, and the plants visited are usually in Chicago or Milwaukee. The trips are taken during term time under the supervision of University authorities. The expense to each student varies from \$15.00 to \$25.00.

NON-TECHNICAL ELECTIVES

The non-technical electives for students in the College of Engineering are subject to the following restrictions:

1. They are restricted to courses offered in the College of Liberal Arts and Sciences and in the College of Commerce.
2. Such courses must not be open to freshman students.
3. The courses must be approved by the head of the department in which the student making the election is registered.
4. Students in the College of Engineering electing the third and fourth years' work in the Reserve Officers' Training Corps may substitute the four hours' credit thus received for three hours of the required non-technical electives.

RHETORIC PREREQUISITE FOR JUNIOR STANDING

At its meeting of June 7, 1915, the University Senate approved the following recommendations of the College of Engineering with reference to requirements in the subject of rhetoric:

1. Rhetoric 1 and 2 shall hereafter be a prerequisite for junior standing in the College of Engineering, and no student in this College shall be permitted to register in more than eight hours of prescribed junior work without having passed or being registered in Rhetoric 1 or 2.
2. Any student in the College of Engineering whose written work shows that he is unable to use good English shall be reported by his instructor to a standing committee of the College of Engineering appointed for this purpose, which committee shall have authority to direct the student to take as a prerequisite for graduation such additional instruction in rhetoric as may be prescribed by the department of English.

CURRICULUMS IN ENGINEERING

The several engineering curriculums have been in the process of transition from schedules in effect before 1914-15 to new schedules, which are effective first for the class of 1919.

The outlines which follow, except in Architecture and Architectural Engineering, show the work of three years of the new schedule. The fourth year, which is labeled, "Fourth Year for the Class of 1918," is a combination of the old and new schedules and is effective only for the senior class graduating in 1918.

Curriculum in Architecture

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Arch. 31—Arch. and Freehand Drawing..	4	Arch. 32—Arch. and Freehand Drawing..	4
G. E. D. 2—Descriptive Geometry.....	4	Chem. 1a ² or 1b—Inorganic Chemistry..	3 or 4
Math. 2—Advanced Algebra.....	3	T. and A. M. 14—Elem. Mechanics.....	4
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ³ —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Engineering Lecture.....	0
Engineering Lecture.....	0		
Total.....	18	Total.....	16 or 17

Summer Reading, 50 points

SECOND YEAR

Arch. 13—History of Architecture.....	2	Arch. 14—History of Architecture.....	2
Arch. 23—Freehand Drawing.....	2	Arch. 24—Freehand Drawing.....	2
Arch. 33—Design.....	3	Arch. 34—Design.....	3
Arch. 43—Working Drawings.....	3	Arch. 44—Working Drawings.....	3
Phys. 9a—Physics Lectures.....	2	Phys. 9b—Physics Lectures.....	2
Phys. 10a—Physics Laboratory.....	2	Phys. 10b—Physics Laboratory.....	2
T. and A. M. 15—Strength of Materials..	3	T. and A. M. 16—Strength of Materials..	3
Mil. 3a—Military Drill.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4b—Military Theory.....	$\frac{1}{2}$
Total.....	18	Total.....	18

Summer Reading, 50 points

¹Semester hours. For definition, see page 85.

²Students who have had chemistry in the high school equivalent to Chemistry 1b will register in Chemistry 1a.

³Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture.....	2
Arch. 25—Freehand Drawing.....	2	Arch. 26—Freehand Drawing.....	2
Arch. 35—Design.....	5	Arch. 36—Design.....	5
Arch. 45—Graphic Statics.....	3	Arch. 46—Roofs.....	3
Arch. 65—Theory of Architecture.....	1	Arch. 55—Building Sanitation.....	1
E. E. 90—Building Illumination.....	1	Arch. 66—Theory of Architecture.....	1
French or German.....	4	French or German.....	4
<hr/>		<hr/>	
Total.....	18	Total.....	18

FOURTH YEAR

Arch. 27—Freehand Drawing.....	2	Arch. 28—Freehand Drawing.....	2
Arch. 37—Design.....	7	Arch. 38—Advanced Design or Thesis...	7
Arch. 68—Specifications.....	3	Arch. 60—Special Lectures.....	1
Arch. 99—Inspection Trip.....	0	Arch. 67—Theory of Form and Color....	2
M. E. 25—Heating and Ventilation.....	2	Non-technical Elective ¹	5
Non-technical Elective ¹	3		
<hr/>		<hr/>	
Total.....	17	Total.....	17

Curriculum in Architectural Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ²		Hours ²
Chem. 1a or 1b—Inorganic Chemistry...3 or 4		Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Desc. Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ³ —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Engineering Lecture.....	0
Engineering Lecture.....	0		
<hr/>		<hr/>	
Total.....	17 or 18	Total.....	18

Summer Reading, 50 points

SECOND YEAR

Arch. 13—History of Architecture.....	2	Arch. 14—History of Architecture.....	2
A. E. 33—Arch. and Freehand Drawing..	3	A. E. 34—Design.....	3
A. E. 43—Working Drawings.....	2	A. E. 44—Working Drawings.....	2
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	$\frac{1}{2}$	T. and A. M. 20—Analytical Mechanics..	3
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
		Mil. 4b—Military Theory.....	$\frac{1}{2}$
<hr/>		<hr/>	
Total.....	18	Total.....	18

Summer Reading, 50 points

¹ Any approved non-technical course. See page 49.² Semester hours. For definition, see page 85.³ Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture.....	2
A. E. 35—Design.....	3	A. E. 36—Design.....	3
A. E. 45—Graphic Statics.....	3	A. E. 46—Graphic Statics.....	3
Language.....	4	Language.....	4
T. and A. M. 25—Resistance of Materials	4	T. and A. M. 26—Analytical Mechanics and	
Non-technical Elective ¹	2	Hydraulics.....	4
		Non-technical Elective ¹	2
Total.....	17 or 18	Total.....	18

FOURTH YEAR

A. E. 47—Architectural Engineering.....	5	A. E. 48—Architectural Engineering.....	5
A. E. 57—Fireproof Construction.....	2	A. E. 58—Fireproof Construction.....	2
A. E. 99—Inspection Trip.....	0	A. E. 67—Building Sanitation.....	2
E. E. 92—Lighting and Wiring.....	2	A. E. 68—Estimates and Specifications...	4
M. E. 23—Mech. Equipment of Buildings	5	Non-technical Elective ¹	3
Non-technical Elective ¹	3		
Total.....	17	Total.....	16

Curriculum in Ceramic Engineering

FIRST YEAR

FIRST SEMESTER

Hours²

Chem. 1a or 1b—Inorganic Chemistry...	3 or 4
G. E. D. 1—Elements of Drafting.....	4
Math. 2—College Algebra.....	3
Math. 4—Trigonometry.....	2
Rhet. 1 ³ —Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hy-	
gience.....	1
Mil. 1a—Military Drill.....	½
Mil. 1b—Military Theory.....	½
Engineering Lecture.....	0

Total.....17 or 18

SECOND SEMESTER

Hours²

Chem. 4—Qualitative Analysis.....	4
G. E. D. 2—Descriptive Geometry.....	4
Math. 6—Analytic Geometry.....	5
Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 2—Gymnasium.....	1
Mil. 2a—Military Drill.....	½
Mil. 2b—Military Theory.....	½
Engineering Lecture.....	0

Total.....18

Summer Reading, 50 points

SECOND YEAR

Chem. 5a—Quantitative Analysis.....	5	Chem. 5b—Quantitative Analysis.....	5
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lecture.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	½	T. and A. M. 20—Analytical Mechanics..	3
Mil. 3b—Military Theory.....	½	Mil. 4a—Military Drill.....	½
Non-Technical Elective.....	3	Mil. 4b—Military Theory.....	½
		Non-Technical Elective.....	3
Total.....	19	Total.....	19

Summer Reading, 50 points

THIRD YEAR

Cer. 1—Ceramic Materials.....	3	Cer. 3—Industrial Calculations.....	3
Cer. 2—Winning and Preparation of Clays	3	Cer. 5—Ceramic Bodies.....	5
Chem. 65—Gas and Fuel Analysis.....	2	Cer. 12—Manufacturing Processes.....	3
French or German.....	4	C. E. 76—Surveying.....	2
T. and A. M. 21—Analytical Mechanics..	2	French or German.....	4
T. and A. M. 25—Resistance of Materials	4		
Total.....	18	Total.....	17

¹Any approved non-technical course. See page 49.²Semester hours. For definition see page 85.³Students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
Cer. 4—Drying and Burning.....	4	Cer. 9—Ceramic Construction.....	4
Cer. 6—Glazes.....	6	M. E. 62—M. E. Laboratory.....	3
Cer. 17—Physical Chemistry.....	4	Non-Technical Elective.....	3
Cer. 99—Inspection Trip.....	0	Thesis or (with the approval of the Depart-	
Technical Elective.....	3	ment) Technical Elective.....	3 or 5
		Technical Elective.....	2 or 0
Total.....	17	Total.....	15

FOURTH YEAR FOR CLASS OF 1918

Cer. 4—Drying and Burning.....	4	Cer. 9—Ceramic Construction.....	4
Cer. 6—Glazes.....	6	Geol. 13b—Engineering Geology.....	3
Cer. 17—Physical Chemistry.....	4	M. E. 62—M. E. Laboratory.....	3
Cer. 99—Inspection Trip.....	0	Technical Elective.....	3
Geol. 13a—Engineering Geology.....	3	Thesis or Technical Elective.....	3
Total.....	17	Total.....	16

Curriculum in Civil Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.....	3 or 4	Chem. 4—Inorganic Chemistry.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hy-		Mil. 2a—Military Drill.....	½
giene.....	1	Mil. 2b—Military Theory.....	½
Mil. 1a—Military Drill.....	½	Engineering Lecture.....	0
Mil. 1b—Military Theory.....	½		
Engineering Lecture.....	0		
Total.....	18	Total.....	18

Summer Reading, 50 points

SECOND YEAR

C. E. 27—Plain Surveying.....	3	C. E. 28—Higher Surveying.....	3
Language.....	4	Language.....	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lecture.....	3	Phys. 1b—Physics Lecture.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	½	T. and A. M. 20—Analytical Mechanics.....	3
Mil. 3b—Military Theory.....	½	Mil. 4a—Military Drill.....	½
		Mil. 4b—Military Theory.....	½
Total.....	18	Total.....	18

Summer Reading, 50 points

THIRD YEAR

C. E. 51—Railroad Surveying.....	5	C. E. 52—Roads and Pavements.....	3
M. E. 1—Steam Engines and Boilers.....	3	C. E. 60—Structural Stresses.....	4
T. and A. M. 21—Analytical Mechanics.....	2	C. E. 62—Structural Details.....	2
T. and A. M. 29—Resistance of Materials.....	5	C. E. 70—Seminar.....	1
Non-technical Elective ³	3	T. and A. M. 10—Hydraulics.....	3
		Non-technical Elective ³	3
Total.....	18	Total.....	16

¹Semester hours. For definition see page 85²Students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.³Any approved non-technical course. See page 49.

FOURTH YEAR FOR THE CLASS OF 1918

C. E. 79—Cement Laboratory.....	1	C. E. 80—Contracts and Specifications...	2
C. E. 81—Theory of Reinforced Concrete	2	C. E. 82—Concrete Design.....	4
C. E. 85—Steel Bridge Design.....	5	Non-technical Elective ¹	3
C. E. 99—Inspection Trip.....	0	Technical elective.....	7
M. and S. E. 2—Water Supply Engineering	4		
Technical Electives.....	5		
Total.....	17	Total.....	16

TECHNICAL ELECTIVES—FOURTH YEAR
1917-18

FIRST SEMESTER		SECOND SEMESTER	
	Hours ²		Hours ²
C. E. 37—Map Reading and Military Sketching.....	2	C. E. 86—Public Service Engineering....	3
C. E. 57—Stream Flow.....	2	C. E. 90—Hydro-Economics.....	2
C. E. 59—Drainage Engineering.....	2	C. E. 94—Highway Administration.....	3
C. E. 77—Masonry Construction.....	4	C. E. 96—Road Materials Laboratory...	2
C. E. 87—Advanced Bridge Analysis.....	2	C. E. 98—Thesis.....	2
C. E. 89—Hydro-Economics.....	2	Chem. 73—Asphalts, Tars, etc.....	2
C. E. 93—Road Construction.....	3	E. E. 4—Electrical Engineering.....	2
C. E. 95—Engineering Functions.....	2	E. E. 64—Electrical Engineering Lab...	1
C. E. 97—Thesis ³	1	M. and S. E. 3—Sewerage.....	3
Min. 1—Earth and Rock Excavation....	3	M. and S. E. 9—Hydraulic Design and Construction.....	2
		R. E. 33—Economics of Railway Location.....	4

Curriculum in Electrical Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ²		Hours ²
Chem. 1a or 1b—Inorganic Chemistry... 3 or 4		Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ⁴ —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Engineering Lecture.....	0
Engineering Lecture.....	0		
Total.....	17 or 18	Total.....	18

Summer Reading, 50 points

SECOND YEAR

Language.....	4	Language.....	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 75 and 77—Forge and Foundry, or M. E. 79—Pattern Work.....	3	M. E. 75 and 77—Forge and Foundry, or M. E. 79—Pattern Work.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	$\frac{1}{2}$	T. and A. M. 20—Analytical Mechanics	3
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
		Mil. 4b—Military Theory.....	$\frac{1}{2}$
Total.....	18	Total.....	18

Summer Reading, 50 points

¹Any approved non-technical course. See page 49.²Semester hours. For definition, see page 85.³Only students having high grades may elect a thesis.⁴Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

E. E. 25—Direct Current Apparatus.....	4	E. E. 26—Alternating Currents.....	4
E. E. 75—Elec. Eng. Laboratory.....	2	E. E. 76—Elec. Eng. Laboratory.....	2
Math. 9a—Integral Calculus.....	2	M. E. 2—Steam Engineering.....	3
M. E. 81—Machine Work.....	3	Phys. 4b—Elec. and Mag. Measurement	2
Phys. 4a—Elec. and Mag. Measurement..	2	T. and A. M. 26—Anal. Mechanics and	
T. and A. M. 25—Resistance of Materials	4	Hydraulics.....	4
		Non-technical Elective ¹	3
Total.....	17	Total.....	18

FOURTH YEAR FOR THE CLASS OF 1918

E. E. 99—Inspection Trip.....	0	E. E. 96—Seminar.....	1
E. E. 95—Seminar.....	1	E. E. 36—Alternating Current Apparatus	4
E. E. 35—Alternating Current Apparatus	4	E. E. 86—Elec. Eng. Laboratory.....	2
E. E. 85—Elec. Eng. Laboratory.....	2	E. E. 56—Electrical Design.....	4
E. E. 55—Electrical Design.....	2	E. E. 98—Thesis ² or elective.....	3
M. E. 61—Power Measurement.....	2	Non-technical Elective ¹	3
M. E. 11—Thermodynamics.....	3		
Non-technical Elective ¹	3		
Total.....	17	Total.....	17

Curriculum in Mechanical Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ³		Hours ³
Chem. 1a or 1b—Inorganic Chemistry. 3 or 4	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ⁴ —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hy-		Mil. 2a—Military Drill.....	$\frac{1}{2}$
giene.....	1	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Engineering Lecture.....	0
Mil. 1b—Military Theory.....	$\frac{1}{2}$		
Engineering Lecture.....	0		
Total.....	17 or 18	Total.....	18

Summer Reading, 50 points

SECOND YEAR

Language.....	4	Language.....	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 75 and 77—Forge and Foundry, or		M. E. 75 and 77—Forge and Foundry, or	
M. E. 79—Pattern Work.....	3	M. E. 79—Pattern Work.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	$\frac{1}{2}$	T. and A. M. 20—Analytical Mechanics.	3
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
		Mil. 4b—Military Theory.....	$\frac{1}{2}$
Total.....	18	Total.....	18

Summer Reading, 50 points

¹Any approved non-technical course. See page 49.²Only students having high grades may elect a thesis.³Semester hours. For definition, see page 85.⁴Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Math. 9a—Integral Calculus.....	2	M. E. 12—Thermodynamics.....	5
M. E. 3—Steam Engineering.....	3	M. E. 30—Mechanics of Machinery.....	5
M. E. 81—Machine Work.....	3	M. E. 64—Power Measurement.....	3
T. and A. M. 21—Analytical Mechanics..	2	M. E. 82—Machine Work.....	2
T. and A. M. 29—Resistance of Materials	5	Non-technical Elective ¹	3
Non-technical Elective ¹	3		
Total.....	18	Total.....	18

FOURTH YEAR FOR THE CLASS OF 1918

E. E. 11—Direct Current Apparatus....	3	E. E. 12—Alternating Current Apparatus	3
E. E. 61—Direct Current Laboratory....	1	E. E. 62—Alternating Current Laboratory	1
M. E. 15—Gas Power Engineering, or		M. E. 26—Heating and Ventilation.....	3
M. E. 33—Principles of Aviation, or		M. E. 32—Power Transmission.....	3
M. E. 37—Principles of Management....	3	M. E. 34—Principles of Aeronautics or	
M. E. 43—Engineering Design.....	5	M. E. 44—Engineering Design, or	
M. E. 65—Power Laboratory.....	3	M. E. 66—Power Laboratory.....	2
M. E. 99—Inspection Trip.....	0	M. E. 52—Power Plant Design.....	3
Non-technical Elective ¹	3		
Total.....	18	Total.....	15

Curriculum in Mining Engineering

FIRST YEAR

FIRST SEMESTER	Hours ²	SECOND SEMESTER	Hours ²
Chem 1a or 1b—Inorganic Chemistry....	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ³ —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hy- giene.....	1	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Engineering Lecture.....	0
Engineering Lecture.....	0		
Total.....	17 or 18	Total.....	18

Summer Reading, 50 points

SECOND YEAR

Geol. 13a—Engineering Geology.....	3	Geol. 13b—Engineering Geology.....	3
Language.....	4	Language.....	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	$\frac{1}{2}$	T. and A. M. 20—Analytical Mechanics..	3
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
		Mil. 4b—Military Theory.....	$\frac{1}{2}$
Total.....	18	Total.....	18

Summer Reading, 50 points

¹Any approved non-technical course. See page 49.²Semester hours. For definition, see page 85.³Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THIRD YEAR

Chem. 5b—Quantitative Analysis.....	4	C. E. 58—Graphic Statics.....	2
C. E. 35—Surveying.....	3	E. E. 4—Elementary Electrical Eng.....	2
M. E. 1—Steam Engineering.....	3	E. E. 64—Electrical Engineering Lab.....	1
Min. 1 ¹ —Earth and Rock Excavation....	3	Min 4 ¹ —Mining Methods.....	3
T. & A. M. 25—Resistance of Materials..	4	Min. 6 ¹ —Mechanical Engineering of Mines	2
		T. and A. M. 26—Analytical Mechanics	
		and Hydraulics.....	4
		Non-technical Elective ²	3
Total.....	17	Total.....	17

FOURTH YEAR FOR THE CLASS OF 1918

I. Coal Mining Option

Chem. 7—Metallurgy.....	3	Min. 8—Mine Law, Admin. and Accounts	3
Chem. 65—Technical Gas and Fuel Analysis.....	2	Min. 13—Utilization of Fuels.....	2
Min. 5—Mine Ventilation.....	3	Min. 42—Coal Plant Design.....	2
Min. 9—Coal and Ore Preparation.....	3	Min. 62—Mine Surveying.....	3
Min. 41—Principles of Coal Plant Design	3	Min. 64—Coal Mining Laboratory.....	3
Min. 99—Inspection Trip.....	0	Min. 68—Mine Topography.....	1
Non-technical Elective ²	3	Min. 90—Mining and Metallurgical Reports	1
		Non-technical Elective ²	3
Total.....	17	Total.....	18

II. Ore Mining Option

Chem. 7—Metallurgy.....	3	Geol. 2—Economic Geology.....	3
Chem. 69—Metallurgical Laboratory and Assaying.....	2	Min. 8—Mine Law, Administration and Accounts.....	3
Min. 15—Principles of Mine Ventilation	1	Min. 44—Ore Plant Design.....	2
Min. 19—Ore and Coal Preparation.....	3	Min. 62—Mine Surveying.....	3
Min. 21—Mine Examination and Valuation.....	2	Min. 66—Ore Concentration Laboratory.	3
Min. 43—Principles of Ore Plant Design..	3	Min. 90—Mining and Metallurgical Reports	1
Min. 99—Inspection Trip.....	0	Non-technical Elective ²	3
Non-technical Elective ²	3		
Total.....	17	Total.....	18

III. Metallurgical Option

Chem. 65—Technical Gas and Fuel Analysis.....	2	Chem. 7a—Non-ferrous Metallurgy.....	3
Chem. 69—Metallurgical Laboratory and Assaying.....	2	Chem 78—Metallography.....	2
Min. 2—Mining Principles.....	3	Min. 8—Administration and Accounts..	2
Min. 17—Problems.....	1	Min. 13—Utilization of Fuels.....	2
Min. 19—Ore and Coal Preparation.....	3	Min. 46—Mill and Smelter Design.....	2
Min. 45—Principles of Mill and Smelter Design.....	3	Min. 66—Ore Concentration Laboratory..	3
Min. 99—Inspection Trip.....	0	Min. 90—Mining and Metallurgical Reports	1
Non-technical Elective ²	3	Non-technical Elective ²	3
Total.....	17	Total.....	18

Summer Reading, 50 points

¹Students in Metallurgical Option take *First Semester*: Chemistry 7—General Metallurgy, instead of Mining 1; *Second Semester*: Chemistry 5b—Advanced Quantitative Analysis instead of Mining 4 and Mining 6.

²Any approved non-technical course. See page 49.

Curriculum in Municipal and Sanitary Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.	3 or 4	Chem. 4—Qualitative Analysis.	4
G. E. D. 1—Elements of Drafting.	4	G. E. D. 2—Descriptive Geometry.	4
Math. 2—Advanced Algebra.	3	Math. 6—Analytic Geometry.	5
Math. 4—Trigonometry.	2	Rhet. 2—Rhetoric and Themes.	3
Rhet. 1 ² —Rhetoric and Themes.	3	Phys. Tr. 2—Gymnasium.	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.	1	Mil. 2a—Military Drill.	$\frac{1}{2}$
Mil. 1a—Military Drill.	$\frac{1}{2}$	Mil. 2b—Military Theory.	$\frac{1}{2}$
Mil. 1b—Military Theory.	$\frac{1}{2}$	Engineering Lecture.	0
Engineering Lecture.	0		
Total.	17 or 18	Total.	18

Summer Reading, 50 points

SECOND YEAR

C. E. 27—Plane Surveying.	3	C. E. 28—Higher Surveying.	3
Language.	4	Language.	4
Math. 7—Differential Calculus.	5	Math. 9—Integral Calculus.	3
Phys. 1a—Physics Lectures.	3	Phys. 1b—Physics Lectures.	2
Phys. 3a—Physics Laboratory.	2	Phys. 3b—Physics Laboratory.	2
Mil. 3a—Military Drill.	$\frac{1}{2}$	T. and A. M. 20—Analytical Mechanics.	3
Mil. 3b—Military Theory.	$\frac{1}{2}$	Mil. 4a—Military Drill.	$\frac{1}{2}$
		Mil. 4b—Military Theory.	$\frac{1}{2}$
Total.	18	Total.	18

Summer Reading, 50 points

THIRD YEAR

Bact. 6—Bacteriology.	2 $\frac{1}{2}$	C. E. 52—Roads and Pavements.	3
Chem. 10b—Water Analysis.	2 $\frac{1}{2}$	C. E. 60—Structural Stresses.	4
C. E. 53—Railroad Surveying.	3	C. E. 62—Structural Details.	2
T. and A. M. 21—Analytical Mechanics.	2	M. E. 2—Steam Engineering.	3
T. and A. M. 29—Resistance of Materials.	5	T. and A. M. 10—Hydraulics.	3
Non-technical Elective ³	2	Non-technical Elective ³	3
Total.	17	Total.	18

FOURTH YEAR FOR THE CLASS OF 1918

C. E. 77—Masonry Construction.	4	C. E. 80—Contracts and Specifications.	2
C. E. 79—Cement Laboratory.	1	E. E. 4—Elementary Electrical Engineering.	2
C. E. 81—Reinforced Concrete.	2	E. E. 64—Electrical Engineering Lab.	1
M. E. 61—Steam Laboratory.	2	M. and S. E. 3—Sewerage.	3
M. and S. E. 2—Water Supply Engineering.	4	M. and S. E. 6b—Water Purification and Sewage Disposal.	2
M. and S. E. 6a—Water Purification and Sewage Disposal.	3	M. and S. E. 9—Hydraulic Design and Construction.	2
M. and S. E. 99—Inspection Trip.	0	M. and S. E. 98—Thesis or Approved Elective.	3
Non-technical Elective. ³	2	Non-technical Elective ³	2
Total.	18	Total.	17

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.³Any approved non-technical course. See page 49.

Curriculum in General Engineering Physics

(Leading to the Degree of B.S.)

The object of this curriculum is to fit persons for investigation of general engineering problems calling for a knowledge of physics and mathematics. Students who expect to teach physics and allied subjects in engineering schools will also find this curriculum of interest.

FIRST YEAR

FIRST SEMESTER	Hours ¹	SECOND SEMESTER	Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.....	3 or 4	Chem. 4—Inorganic Chemistry.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	½
Mil. 1a—Military Drill.....	½	Mil. 2b—Military Theory.....	½
Mil. 1b—Military Theory.....	½	Engineering Lecture.....	0
Engineering Lecture.....	0		
<hr/>		<hr/>	
Total.....	17 or 18	Total.....	18
Summer Reading, 50 points			

SECOND YEAR

German 1—Elementary German or French 1a.....	4	Math. 9—Integral Calculus.....	3
Math. 7—Differential Calculus.....	5	German 3—Narrative Prose or French... ..	4
Chem. 5d—Elementary Quantitative Analysis.....	4	Chemistry (Elective).....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	½	T. and A. M. 20—Analytical Mechanics .	3
Mil. 3b—Military Theory.....	½	Mil. 4a—Military Drill.....	½
		Mil. 4b—Military Theory.....	½
<hr/>		<hr/>	
Total.....	19	Total.....	18
Summer Reading, 50 points			

THIRD YEAR

Math. 9a—Advanced Calculus.....	2	Phys. 4b—Electrical Measurements.....	2
Phys. 4a—Electrical Measurements.....	2	Phys. 17—Lighting, or 23—Sound.....	3
Phys. 16—Heat.....	3	M. E. 62—Steam engines, etc.....	3
E. E. 25—D. C. Theory.....	4	E. E. 26—Alternating Current Theory... ..	4
E. E. 75—D. C. Laboratory.....	2	E. E. 76—Alternating Current Laboratory	2
T. and A. M. 25—Resistance of Materials	4	Electives ³	3-4
<hr/>		<hr/>	
Total.....	17	Total.....	17-18

FOURTH YEAR

Phys. 14a—Dynamics.....	3	Math. 17—Differential Equations.....	3
Phys. 31a—Special Investigation.....	3	Phys. 24—Properties of Matter or	
Math. 16—Adv. Cal. and Diff. Equations	3	Phys. 30—Introduction to Theoretical Electricity.....	3
M. E. 11—Thermodynamics.....	3	Phys. 31b—Thesis.....	3
Physics Colloquium.....	0	Chem. 31—Physical Chemistry.....	4
Elective ³	3-5	Elective ³	3-4
<hr/>		<hr/>	
Total.....	15-17	Total.....	16-17

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

³At least nine hours of electives must be non-technical and the number selected should be such as to give a total of 141 semester hours.

Curriculum in Railway Civil Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry.....	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Engineering Lecture.....	0
Engineering Lecture.....	0		

Total.....17 or 18

Total.....19

Summer Reading, 50 points

SECOND YEAR

C. E. 27—Surveying.....	3	C. E. 28—Topographical Surveying.....	3
Language.....	4	Language.....	4
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
Phys. 1a—Physics Lectures.....	3	Phys. 1b—Physics Lectures.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 3b—Physics Laboratory.....	2
Mil. 3a—Military Drill.....	$\frac{1}{2}$	T. and A. M. 20—Analytical Mechanics..	3
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
		Mil. 4b—Military Theory.....	$\frac{1}{2}$

Total.....18

Total.....18

Summer Reading, 50 points

THIRD YEAR

C. E. 51—Railroad Surveying.....	5	C. E. 60—Structural Stresses.....	4
R. E. 25—Railway Development.....	3	C. E. 62—Structural Details.....	2
T. and A. M. 21—Analytical Mechanics..	2	R. E. 31—Ry. Yards and Terminals....	3
T. and A. M. 29—Resistance of Materials	5	T. and A. M. 10—Hydraulics.....	3
Non-technical Electives ³	3	Non-technical Electives ³	3
		Technical Elective.....	2

Total.....18

Total.....17

FOURTH YEAR FOR THE CLASS OF 1918

C. E. 77—Masonry Construction.....	4	C. E. 80—Eng. Construction and Specifications.....	2
C. E. 79—Cement Laboratory.....	1	E. E. 4—Elem. Electrical Eng.....	2
C. E. 81—Reinforced Concrete Theory...	2	E. E. 64—Elec. Engineering Lab.....	1
C. E. 83—Bridge Design.....	3	R. E. 51—Seminar.....	1
M. E. 1—Steam and Air Machinery.....	3	R. E. 98—Thesis (or elective).....	3
R. E. 50—Seminar.....	1	Non-technical Elective ³	3
R. E. 99—Inspection Trip.....	0	Technical Elective.....	4
Technical Elective.....	4		

Total.....18

Total.....16

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.³Any approved non-technical course. See page 49.

Curriculum in Railway Electrical Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry...	3 or 4	Chem. 4—Qualitative Analysis.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—College Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Plane Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hy- giene.....	1	Mil. 2a—Military Drill.....	½
Mil. 1a—Military Drill.....	½	Mil. 2b—Military Theory.....	½
Mil. 1b—Military Theory.....	½	Engineering Lecture.....	0
Engineering Lecture.....	0		
Total.....	17 or 18	Total.....	18
Summer Reading, 50 points			

SECOND YEAR

Language.....	4	Language.....	
Math. 7—Differential Calculus.....	5	Math. 9—Integral Calculus.....	3
M. E. 77—Foundry Work.....	3	M. E. 75—Forge Work.....	1
Phys. 1a—Physics Lectures.....	3	M. E. 79—Pattern Work.....	2
Phys. 3a—Physics Laboratory.....	2	Phys. 1b—Physics Lectures.....	2
Mil. 3a—Military Drill.....	½	Phys. 3b—Physics Laboratory.....	2
Mil. 3b—Military Theory.....	½	T. and A. M. 20—Analytical Mechanics.....	3
		Mil. 4a—Military Drill.....	½
		Mil. 4b—Military Theory.....	½
Total.....	18	Total.....	18
Summer Reading, 50 points			

THIRD YEAR

E. E. 25—Direct Current Apparatus....	4	E. E. 26—Alternating Currents.....	4
E. E. 75—Electrical Laboratory.....	2	E. E. 76—Electrical Laboratory.....	2
M. E. 81—Machine Work.....	3	M. E. 2—Steam Engineering.....	3
Phys. 4a—Electrical and Magnetic Meas- urements.....	2	Phys. 4b—Electrical and Magnetic Meas- urements.....	2
R. E. 25—Railway Development.....	3	R. E. 60—Electric Railway Principles....	2
T. and A. M. 25—Resistance of Materials	4	T. and A. M. 36—Analytical Mechanics.....	2
		Non-technical Elective ³	3
Total.....	18	Total.....	18

FOURTH YEAR FOR THE CLASS OF 1918

M. E. 11—Thermodynamics.....	3	E. E. 56—Electrical Design.....	4
M. E. 61—Mechanical Laboratory.....	2	R. E. 63—Electric Railway Laboratory..	2
R. E. 62—Electric Railway Laboratory..	2	R. E. 65—Electric Railway Economics...	4
R. E. 64—Electric Railway Practise....	3	R. E. 98—Thesis (or elective).....	3
R. E. 66—Electric Railway Machinery...	3	Non-technical Elective ³	3
R. E. 67—Seminar.....	1		
R. E. 99—Inspection Trip.....	0		
Non-technical Elective ³	3		
Total.....	17	Total.....	16

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.³Any approved non-technical course. See page 49.

Curriculum in Railway Mechanical Engineering

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Chem. 1a or 1b—Inorganic Chemistry...	3 or 4	Chem. 4—Advanced Chemistry.....	4
G. E. D. 1—Elements of Drafting.....	4	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Math. 6—Analytic Geometry.....	5
Math. 4—Trigonometry.....	2	Rhet. 2—Rhetoric and Themes.....	3
Rhet. 1 ² —Rhetoric and Themes.....	3	Phys. Tr. 2—Gymnasium.....	1
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Engineering Lecture.....	0
Engineering Lecture.....	0		

Total..... 17 or 18

Total..... 18

Summer Reading, 50 points

SECOND YEAR

Language.....	4	Language.....	4
Math. 7—Differential Calculus.....	5	M. E. 77—Foundry Work.....	3
M. E. 75—Forge Work.....	1	Math. 9—Integral Calculus.....	3
M. E. 79—Pattern Work.....	2	Phys. 1b—Physics Lectures.....	2
Phys. 1a—Physics Lectures.....	3	Phys. 3b—Physics Laboratory.....	2
Phys. 3a—Physics Laboratory.....	2	T. and A. M. 20—Analytical Mechanics..	3
Mil. 3a—Military Drill.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4b—Military Theory.....	$\frac{1}{2}$

Total..... 18

Total..... 18

Summer Reading, 50 points

THIRD YEAR

Math. 9a—Integral Calculus.....	2	M. E. 12—Thermodynamics.....	5
M. E. 81—Machine Work.....	3	M. E. 64—Power Measurement.....	3
R. E. 25—Railway Development.....	3	M. E. 82—Machine Work.....	2
T. and A. M. 21—Analytical Mechanics..	2	R. E. 6—Locomotives.....	4
T. and A. M. 29—Resistance of Materials	5	Non-technical Elective ³	3
Non-technical Elective ³	3		

Total..... 18

Total..... 17

FOURTH YEAR FOR THE CLASS OF 1918

E. E. 11—Direct Current Apparatus....	3	E. E. 12—Alternating Current Apparatus	3
E. E. 61—Direct Current Laboratory....	1	E. E. 62—Alternating Current Laboratory	1
M. E. 37—Science of Management.....	3	R. E. 7—Advanced Design.....	3
R. E. 2—Locomotive Design.....	3	R. E. 8—Railway Laboratory.....	2
R. E. 5—Railway Laboratory.....	3	R. E. 61—Electric Traction.....	3
R. E. 9—Seminar.....	1	R. E. 98—Thesis.....	3
R. E. 99—Inspection Trip.....	0	Non-technical Elective ³	2
Non-technical Elective ³	3		

Total..... 17

Total..... 17

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.³Any approved non-technical course. See page 49.

THE COLLEGE OF AGRICULTURE

Agricultural students should read the General Directions for Registration given in paragraphs 1-29 on pages 9-16. Further special directions will be furnished them with their study-lists.

REQUIREMENTS FOR GRADUATION

Students who have satisfied all matriculation requirements and have maintained throughout their course a satisfactory record of scholarship and moral character will be graduated with the degree of Bachelor of Science, upon having completed the studies of the prescribed list and sufficient electives to make a total of 130 semester hours.

A thesis is not required for graduation, but any student who has completed not less than 90 hours of credit before the senior year may then elect a thesis course in any department in which he has done not less than 20 hours' work, subject to the approval of the head of the department in question.

Graduates of approved colleges may expect to secure a degree in agriculture from the University of Illinois on completion of the technical and scientific requirements. This will ordinarily require approximately two years of residence work; a minimum of one year is required.

In physical training not more than five semester hours for men and seven semester hours for women are accepted toward graduation.

General Curriculum in Agriculture

All students except those in the special curriculums in household science, floriculture, and landscape gardening are required to take the same work during the freshman year and part of the sophomore year. This work gives the student a correct conception of the fundamental farm practises and an insight into the technical branches of agriculture, such as animal and dairy husbandry, horticulture, farm crops, soils, farm mechanics, and buildings, and leaves the junior and senior years open for elective studies.

One hundred thirty hours are required for graduation, as follows:

Agriculture prescribed first two years.....	19 hours	
Agriculture prescribed as electives.....	40 hours	
		<hr/>
Total agriculture required.....		59 hours
Non-agriculture prescribed.....	41 hours	
Non-agriculture prescribed as electives.....	15 hours	
		<hr/>
Total non-agriculture required.....		56 hours
Open electives.....		15 hours
		<hr/>
		130 hours

PRESCRIBED SUBJECTS

Required for the Degree of Bachelor of Science in the General Curriculum in Agriculture

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Agron. 25—Farm Crops.....	4	Agron. 25—Farm Crops.....	4
Chem. 1—Inorganic Chemistry.....	5	or	
or		A. H. 5—Live Stock Judging.....	3
A. H. 5—Live Stock Judging.....	3	D. H. 3—Elements of Dairy Husbandry..	1
D. H. 3—Elements of Dairy Husbandry..	1	and	
Chem. 1a—Inorganic Chemistry.....	3	Chem. 2a—Inorganic Chemistry and Qual-	
and		itative Analysis.....	5
Ag. Ext. 4—Elementary Agricultural		Hort. 1b—Elements of Horticulture.....	2
Extension.....	1	Rhet. 2—Rhetoric and Themes.....	3
Hort. 1a—Elements of Horticulture.....	2	Phys. Tr. 2—Gymnasium.....	1
Rhet. 1 ² —Rhetoric and Themes.....	3	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Phys. Tr. 1 and 1a—Gymnasium and Hy-		Mil. 2b—Military Theory.....	$\frac{1}{2}$
giene.....	1		
Mil. 1a—Military Drill.....	$\frac{1}{2}$		
Mil. 1b—Military Theory.....	$\frac{1}{2}$		
Total.....	15-17	Total.....	16

SECOND YEAR

A. H. 8 and 21—Principles of Breeding		A. H. 8 and 21—Principles of Breeding	
and Feeding.....	3	and Feeding.....	3
Botany 1—General Botany.....	5	Botany 1—General Botany.....	5
or		or	
Agronomy 26—Elementary Farm Mech-		Agronomy 26—Elementary Farm Mech-	
anics.....	3	anics.....	3
Chemistry 13a—Elementary Quantitative		Chemistry 13a—Elementary Quantitative	
Analysis.....	5	Analysis.....	5
and		and	
Mil. 3a—Military Drill.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4b—Military Theory.....	$\frac{1}{2}$
Electives.....	6-9	Electives.....	6-9
Total.....	15-18	Total.....	15-18

In addition to the prescribed subjects, students will take the following:

Agriculture, electives.....	40 hours
Non-agriculture, electives.....	15 hours
English 20.....	4 hours
Science, elective.....	5 hours
Open electives.....	15 or 17 hours

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

Curriculum in Farm Organization and Management

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
	Hours ¹		Hours ¹
Ag. Ext. 4—Elementary Agricultural Extension	1	A. H. 5—Live Stock Judging.	3
Agron. 25—Farm Crops.	4	Chem. 2a—Inorganic Chemistry and Qualitative Analysis.	5
Chem. 1or 1a—Inorganic Chemistry.	5 or 3	D. H. 3—Elements of Dairy Husbandry.	1
Hort. 1a—Elements of Horticulture.	2	Hort. 1b—Elements of Horticulture.	2
Rhet. 1 ² —Rhetoric and Themes.	3	Rhet. 2—Rhetoric and Themes.	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.	1	Phys. Tr. 2—Gymnasium.	1
Mil. 1a—Military Drill.	$\frac{1}{2}$	Mil. 2a—Military Drill.	$\frac{1}{2}$
Mil. 1b—Military Theory.	$\frac{1}{2}$	Mil. 2b—Military Theory.	$\frac{1}{2}$
Total.	15-17	Total.	16

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Chem. 13a—Elementary Qualitative Analysis.	5	Agron. 26—Elementary Farm Mechanics.	3
A. H. 8 and 21—Principles of Breeding and Feeding.	3	Mil. 4a—Military Drill.	$\frac{1}{2}$
Mil. 3a—Military Drill.	$\frac{1}{2}$	Mil. 4b—Military Theory.	$\frac{1}{2}$
Mil. 3b—Military Theory.	$\frac{1}{2}$		

In addition to the above courses, the following are also prescribed:

Accountancy 11 or 1.	3 or 6 hours
Economics 2 or 1.	3 or 5 hours
Economics 16c.	3 hours
Economics 22.	3 hours
Economics 26.	3 hours
Business Law 2.	3 hours
Elective economics, minimum of.	6 hours
Farm Management 1.	3 hours
English 20.	4 hours
Philosophy 1.	3 hours
Elective science, minimum of.	10 hours
Elective agriculture, minimum of.	28 hours
Open electives.	13 or 6 hours

Total prescribed. 130 hours

To avoid conflicts with other prescribed work it is suggested that the courses in economics, accountancy, and farm management be taken in the following order:

SECOND YEAR

Economics 26.	3	Economics 1 or 2.	5 or 3
		Economics 22.	3

THIRD YEAR

Accountancy 11 or 1.	3 or 6	Economics 14.	2
		Economics 16c.	3
		Farm Management 1.	3

FOURTH YEAR

Economics 15.	2	Business Law 2.	3
		Economics 17.	2

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

Curriculum in Floriculture

(Required for the degree of B.S. in Floriculture)

The object of this curriculum is to fit men and women for the profession of floriculture. The laboratory exercises in the technical subjects consist of practical work in the greenhouses and gardens and give the students a working knowledge of the best methods now in use.

FIRST YEAR

FIRST SEMESTER <i>Prescribed Subjects</i>		SECOND SEMESTER <i>Prescribed Subjects</i>	
	Hours ¹		Hours ¹
Chem. 1 or 1a—Inorganic Chemistry.	5 or 3	Chem. 2a—Inorganic Chemistry and Qualitative Analysis.	5
Hort. 5—Plant Propagation.	5	Hort. 4—Plant Houses.	4
Rhet. 1 ² —Rhetoric and Themes.	3	Rhet. 2—Rhetoric and Themes.	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.	1	Phys. Tr. 2—Gymnasium.	1
Mil. 1a—Military Drill.	$\frac{1}{2}$	Mil. 2a—Military Drill.	$\frac{1}{2}$
Mil. 1b—Military Theory.	$\frac{1}{2}$	Mil. 2b—Military Theory.	$\frac{1}{2}$
Total.	13 or 15	Total.	15

SECOND YEAR

Agron. 9—Soil Physics.	5	Ent. 4—Economic Entomology.	3
Bot. 1—General Botany.	5	Hort. 15a—Principles of Plant Growing.	5
Engl. 20—Chief English Writers.	4	Hort. 24a—Trees and Shrubs.	3
Mil. 3a—Military Drill.	$\frac{1}{2}$	Hort. 31—Garden Flowers.	3
Mil. 3b—Military Theory.	$\frac{1}{2}$	Mil. 4a—Military Drill.	$\frac{1}{2}$
Total.	15	Mil. 4b—Military Theory.	$\frac{1}{2}$
		Total.	15

THIRD YEAR

Bot. 27a—Plant Physiology.	5	Econ. 2—Principles of Economics.	3
Hort. 15b—Commercial Crops.	5	Hort. 7—Spraying.	3
Hort. 24b—Trees and Shrubs.	3	Hort. 30—Decorative Plants.	5
Total.	13	Hort. 42—Landscape Design.	3
		Total.	14

FOURTH YEAR

Bot. 7a—Plant Pathology.	5	Hort. 32b—Floral Decoration.	3
Hort. 32a—Floral Decoration.	3	Total.	3
Total.	8		

Suggested Electives

Accountancy.	
Chem. 13a—Elementary Quantitative Analysis.	5
Economics.	

Suggested Electives

Agron. 12—Soil Fertility.	5
A. H. 30—Genetics.	5
Bot. 3a—Plant Anatomy.	5
Bot. 4a—Taxonomy of Cormophytes.	5
Bot. 7b—Methods of Study of Fungi.	5
Hort. 28—Exotics.	1

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

Curriculum in Landscape Gardening

(Required for the degree of B.S. in Landscape Gardening)

A four years' course in preparation for professional practise of landscape gardening. Courses are open to any student in the University having the prerequisites or their equivalents. Students may petition for the substitution of first or second year French for an equal number of hours of required work on approval of the department.

FIRST YEAR

FIRST SEMESTER <i>Prescribed Subjects</i>		SECOND SEMESTER <i>Prescribed Subjects</i>	
	Hours ¹		Hours ¹
Arch. 31—Architectural Drawing.....	4	Arch. 32—Architectural Drawing.....	4
Hort. 5—Plant Propagation.....	5	Bot. 1—Introductory Course.....	5
Hort. 10a—Rural Improvement.....	2	Hort. 10b—Town Improvement.....	2
Rhet. 1 ² —Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 1 and 1a—Gymnasium and Hygiene.....	1	Phys. Tr. 2—Gymnasium.....	1
Mil. 1a—Military Drill.....	½	Mil. 2a—Military Drill.....	½
Mil. 1b—Military Theory.....	½	Mil. 2b—Military Theory.....	½
Total.....	16	Total.....	17

SECOND YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Bot. 4d—Taxonomy.....	3	C. E. 32—Surveying.....	3
C. E. 31—Surveying.....	3	Hort. 21b—Landscape Design.....	4
Hort. 21a—Landscape Design.....	4	Hort. 24a—Trees and Shrubs.....	3
Mil. 3a—Military Drill.....	½	Hort. 31—Garden Flowers.....	3
Mil. 3b—Military Theory.....	½	Mil. 4a—Military Drill.....	½
		Mil. 4b—Military Theory.....	½
Total.....	11	Total.....	14
<i>Electives</i>		<i>Electives</i>	
A. and D. 12—Theory and Practise.....	2	Arch. 14—History of Architecture.....	2
Arch. 13—History of Architecture.....	2	Ent. 4b—Introductory Economic Entomology.....	3
A. and D. 10—Sketching.....	1	Geol. 12—Geology of Soils.....	5
		Hort. 2—Small Fruits.....	3
		Zool. 16—Field Ornithology.....	2

THIRD YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
Hort. 23a—Landscape Design.....	4	Hort. 23b—Landscape Design.....	4
Hort. 24b—Trees and Shrubs.....	3	Hort. 26a—Planting Design.....	3
Hort. 27a—Landscape Construction.....	3	Hort. 27b—Landscape Construction.....	3
		Hort. 36—Landscape History.....	2
		Hort. 41—Civic Design (Elementary Course).....	1
Total.....	10	Total.....	13
<i>Electives</i>		<i>Electives</i>	
Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture.....	2
A. and D. 13—History and Practise.....	2	A. and D. 8—Modeling.....	2
Econ. 2—Principles of Economics.....	2	Bot. 20—Plant Diseases.....	3
Hort. 8—Fruit Culture.....	5	Hort. 7—Spraying.....	3
Hort. 29a—Garden Design.....	3	Hort. 29b—Garden Design.....	3
Pol. Sci. 1—American Government.....	3	Rhet. 17—Advanced Composition.....	3
Sociol. 1—Principles of Sociology.....	3	Sociol. 7—The Rural Community.....	2
		Ent. 20—Insects of the Garden.....	2

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

FOURTH YEAR

<i>Prescribed Subjects</i>		<i>Prescribed Subjects</i>	
C. E. 55—Roads and Pavements.....	2	Hort. 25b—Landscape Design.....	5
Hort. 25a—Landscape Design.....	5	Hort. 28—Exotics.....	1
Hort. 26b—Planting Design.....	3	Hort. 37b—Civic Design.....	3
Hort. 37a—Civic Design.....	3	Hort. 38b—Office Practise in Landscape Gardening.....	2
Hort. 38a—Office Practise in Landscape Gardening.....	2		
Total.....	15	Total.....	11
<i>Electives</i>		<i>Electives</i>	
A. and D. 4—Water Color.....	2	Hort. 15a—Plant Growing.....	5
Hort. 40a—Trees and Shrubs (Advanced Course).....	3	Hort. 40b—Trees and Shrubs (Advanced Course).....	3
Pol. Sci. 4—Municipal Government.....	3	Ent. 20—Insects of the Garden.....	2
Sociol. 10—Population.....	3		
<i>General Electives</i>			
Hort. 19—Amateur Floriculture.....	3	Chem. 1 or 1a—Inorganic Chemistry....	5 or 3
Hort. 39 ¹ —Special Lectures.....	1-8	Modern Language.....	8
Zool. 1—General Zoology.....	5	Physics.....	10

Curriculum for Prospective Teachers of Agriculture

A curriculum is offered for prospective teachers of agriculture. Among the subjects recommended are the following.

Agronomy 2, 9, 12, 25, 26; Animal Husbandry 1a, 2a, 4a, 5, 6, 11a, 11b, 30;² Dairy Husbandry 2, 3; Horticulture 1a, 1b, 3, 5, 10a, 19; Agricultural Extension, 1, 3, 4; Botany 1, 3b; Chemistry 1, 2a, 13a; Entomology 4a-4b; Zoology 1; English 20; Rhetoric 1-2, 19; Public Speaking 5-6; Economics 2; Education 1, 6; Library Science 12; Military 1a, 2a, 3a, 4a, and 1b, 2b, 3b, 4b; Physical Training, 1-2, 1a; foreign language.

Curriculum in Household Science

Of the 130 hours required for graduation, 92 are provided for in the prescribed list and the restricted electives of List A. The other 40 hours of credit necessary for graduation may be taken, subject to the approval of the Dean of the College, from any courses offered in the University. Holders of scholarships in household science in this college take the course as laid out here. Variations from it can be made only by special permission of the Council of Administration on recommendation of the faculty of the College.

PRESCRIBED SUBJECTS

Required for Degree of Bachelor of Science in Household Science

Art and Design 1, 12, 19, 20.....	9 hours
Bacteriology 5.....	5 hours
Botany 1 or Zoology 1.....	5 hours
Chemistry 1 or 1a, 2a.....	8 or 10 hours
Economics 2.....	3 hours
English 1, 2.....	8 hours
Household Science 1, 2, 3, 5, 6, 7, 12, 13, 19.....	25 hours
History 1a-1b, or 3a-3b.....	6 or 8 hours
Physiology 4a or 4b.....	5 hours

¹Students taking the professional course are required to register in Horticulture 39 *each semester*.

²Students taking the Teachers' Curriculum may take Animal Husbandry 30 for one-half semester and receive 2½ credits therefor.

Physical Training 7a-7b, 9.....	3 hours
Rhetoric 1, 2.....	6 hours
English or Rhetoric.....	5 hours
List A, a minimum of	4 hours

Total required subjects.....	92 to 96 hours
Electives	38 to 34 hours

Total.....	130 hours
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ELECTIVES

List A—English 12, 13, 21, 22, 23, 24
Horticulture 1a, 1b, 2, 3, 5, 10a, 19, 28
Household Science 11, 14, 17, 18
Economics 22, 26
Sociology 1
Physics 7a, 8a
Education 1, 6, 10
Agronomy 7, 9, 12, 25, 26
Animal Husbandry 10, 5
Dairy Husbandry 1, 3, 4, 11, 13
Agricultural Extension 1, 3, 4

Suggested Curriculum

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
A. and D. 1—Freehand Drawing.....	3	Chem. 2a—Inorg. Chem. and Qual. Anal.....	5
Chem. 1 ² or 1a—Inorganic Chemistry.....	5 or 3	Econ. 22—Economic History of the U. S.....	3
H. Sci. 2—Home Arch. and Sanitation.....	2	H. Sci. 1 ² —Sel. and Prep. of Food.....	3
Rhet. 1 ⁴ —Rhetoric and Themes.....	3	H. Sci. 7—Textiles.....	2
Lib. Sci. 12—General Reference.....	2	Rhet. 2—Rhetoric and Themes.....	3
Phys. Tr. 7a—Gymnasium Practise.....	1	Phys. Tr. 7b—Gymnasium.....	1
Phys. Tr. 9—Hygiene.....	1		
Total.....	17 or 15	Total.....	17

SECOND YEAR

Bot. or Zool. 1—Introductory Course.....	5	A. and D. 12—Applied Design.....	2
Engl. 1—Survey of Eng. Lit.....	4	Econ. 2—Principles of Economics.....	3
H. Sci. 6—Econ. Uses of Food.....	4	Engl. 2—Survey of Eng. Lit.....	4
Econ. 26—Economic Resources or		Physiol. 4—Minor Course.....	5
Hort. 19—Amateur Floriculture.....	3		
Total.....	16	Total.....	14

THIRD YEAR

A. and D. 19—History of Fine Arts.....	2	A. and D. 20—History of Fine Arts.....	2
Engl. 23—Intro. to Shakespeare.....	3	Bact. 5—Intro. Bacteriology.....	5
Hist. 1a—Continental European History,		Hist. 1b—Continental European History,	
or		or	
Hist. 3a—History of the U. S.....	4 or 3	Hist. 3b—History of the U. S.....	4 or 3
H. Sci. 5—Dietetics.....	3	H. Sci. 3—Home Decoration.....	3
H. Sci. 19—Dress Design.....	3	H. Sci. 12—Clothing.....	2
Total.....	15 or 14	Total.....	16 or 15

¹Semester hours. For definition, see page 85.²If Chemistry 1a is taken, a 2-hour elective must be added, with the approval of the adviser.³Attention is called to the fact that high school physics is a prerequisite for Household Science 1.⁴Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

FOURTH YEAR

Educ. 1—Intro. to Education.....	4	Educ. 10—Technics of Teaching.....	3
H. Sci. 13—Hist. of Home Economics ..	2	H. Sci. 9—Individual Problems.....	3
H. Sci. 15—Economics of the Family....	3	H. Sci. 10—Home Management.....	2
Sociol. 1—Principles of Sociology.....	3	H. Sci. 11—Teachers' Course.....	3
		H. Sci. 17—Study of Textiles.....	3
		H. Sci. 28—Organization of the Household	3
Total.....	12	Total.....	17

Curriculum in Interior Decoration

(Required for the Degree of B.S. in Household Science)

Of the 130 hours required for graduation, 97 are provided for in the curriculum. The other 33 hours of credit necessary for graduation may be taken, subject to the approval of the Dean of the College, from any courses offered in the University, for which the student may have the prerequisites.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Arch. 31—Architecture and Freehand Drawing.....	4	Arch. 32—Architecture and Freehand Drawing.....	4
H. Sci. 2—Home Architecture and Sanitation.....	2	G. E. D. 2—Descriptive Geometry.....	4
Math. 2—Advanced Algebra.....	3	Rhet. 2—Rhetoric and Themes.....	3
Math. 4—Trigonometry.....	2	Phys. Tr. 7b—Gymnasium.....	1
Rhet. 1 ² —Rhetoric and Themes.....	3		
Phys. Tr. 7a—Gymnasium.....	1		
Phys. Tr. 9—Hygiene.....	1		
Total.....	16	Total.....	12

SECOND YEAR

Arch. 13—History of Architecture.....	2	Arch. 14—History of Architecture.....	2
Arch. 23—Freehand Drawing.....	2	Arch. 24—Freehand Drawing.....	2
Arch. 33—Architectural Design.....	3	Arch. 34—Architectural Design.....	3
Arch. Eng. 43—Working Drawings.....	2	Arch. Eng. 44—Working Drawings.....	2
French or German.....	4	French or German.....	4
Total.....	13	Total.....	13

THIRD YEAR

Arch. 15—History of Architecture.....	2	Arch. 16—History of Architecture.....	2
H. Sci. 22—Theory of Color.....	3	H. Sci. 23—Theory of Color.....	3
H. Sci. 7—Textiles.....	2	H. Sci. 3—Elementary Home Decoration.....	3
H. Sci. 21—Weaving.....	1	H. Sci. 17—Problems in the Study of Textiles.....	3
Hort. 21a—Landscape Design.....	4	Hort. 21b—Landscape Design.....	4
Total.....	12	Total.....	15

FOURTH YEAR

Arch. 67—Theory of Form and Color.....	2	E. E. 92—Lighting and Wiring.....	2
H. Sci. 24—Color Application (Freehand)	2	H. Sci. 25—Color Application (Freehand).	2
H. Sci. 26—Floor and Wall Coverings....	3	H. Sci. 27—Furniture, brasses.....	3
History of Sculpture and Painting.....	2		
Total.....	9	Total.....	7

¹Semester hours. For definition, see page 85.²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

THE SCHOOL OF MUSIC

Music students should read the General Directions for Registration given in paragraphs 1-29 on pages 9-16. Having secured their study-lists (see paragraphs 1-6) they should report to their advisers in Room 201, University Hall.

Each student should follow, *point by point*, the directions given on the first coupon of his or her study-list.

Each student must report to the Chapel, 218 University Hall, after having secured the study list at the office of the School of Music, to secure approval of sections chosen in sectional courses (other than courses in music), and pay the fees.

Practise pianos in the Woman's Building (or in University Hall, for men) may be secured at the rate of \$3 a semester for one hour a day. A two-manual and pedal practise organ is installed in University Hall for the use of organ students at a reasonable fee.

CHORAL or ORCHESTRA work is *required* of all students who are taking courses in applied music.

All music students are required to attend the concerts and recitals which are given under the auspices of the School of Music.

Public performance being part of the course of study in a practical subject, all students are required to participate in a program when sufficiently prepared.

Students, who by reason of deficient musical ability, inattention, or other valid reason, fail to make satisfactory progress, may be dropped from the classes.

REQUIREMENTS FOR GRADUATION

Candidates for the degree of Bachelor of Music must offer credit for 130 semester hours, including the prescribed subjects named below, together with an acceptable thesis on a topic related to music.

Curriculum in Music

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Music 3—Harmony.....	2	Music 4—Harmony.....	2
Music 42a, 52a, 62a, or 81—Piano, Voice, Violin, or Organ (Major Subject).....	4	Music 42b, 52b, 62b, or 82—Piano, Voice, Violin, or Organ (Major Subject).....	4
Music 46a, 56a, 66a, or 83a—Piano, Voice, Violin, or Organ (Minor Subject).....	2	Music 46b, 56b, 66b, or 83b—Piano, Voice, Violin, or Organ (Minor Subject).....	2
Music 21a—Ear Training.....		Music 21b—Ear Training.....	
Rhet. 1 ^a —Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Foreign Language—French, German, or Italian.....	4	Foreign Language—French, German, or Italian.....	4
Phys. Tr. 7a—Gymnasium (women).....	1	Phys. Tr. 7b—Gymnasium (women).....	1
Phys. Tr. 9—Hygiene (women).....	1	Phys. Tr. 2—Gymnasium (men).....	1
Phys. Tr. 1—Gymnasium (men).....	$\frac{1}{2}$	Mil. 2a—Military Drill (men).....	$\frac{1}{2}$
Phys. Tr. 1a—Hygiene (men).....	$\frac{1}{2}$	Mil. 2b—Military Theory (men).....	$\frac{1}{2}$
Mil. 1a—Military Drill (men).....	$\frac{1}{2}$		
Mil. 1b—Military Theory (men).....	$\frac{1}{2}$		
<hr/>		<hr/>	
Total, Men.....	17	Total, Men.....	17
Total, Women.....	17	Total, Women.....	16

¹Semester hours. For definition, see page 85.

²Those students who show by examination a proficiency in composition sufficient to qualify them for Rhetoric 2, may be excused from Rhetoric 1. See page 12.

SECOND YEAR

Music 1—History of Music.....	2	Music 2—History of Music.....	2
Music 5—Advanced Harmony.....	3	Music 6—Advanced Harmony.....	3
Music 43a, 53a, 63a, or 84—Piano, Voice, Violin, or Organ (Major Subject).....	4	Music 43b, 53 b, 63b, or 85—Piano, Voice, Violin, or Organ (Major Subject).....	4
Music 46c, 56c, 66c, or 83c—Piano, Voice, Violin, or Organ (Minor Subject).....	2	Music 46d, 56d, 66d, or 83d—Piano, Voice, Violin, or Organ (Minor Subject).....	2
Music 22a—Ear Training.....	1	Music 22b—Ear Training.....	1
Music 23a—Sight Singing.....		Music 23b—Sight Singing.....	
Foreign Language—French, German, or Italian.....	4	Foreign Language—French, German or Italian.....	4
Mil. 3a—Military Drill (men).....	$\frac{1}{2}$	Mil. 4a—Military Drill (men).....	$\frac{1}{2}$
Mil. 3b—Military Theory (men).....	$\frac{1}{2}$	Mil. 4b—Military Theory (men).....	$\frac{1}{2}$
<hr/>		<hr/>	
Total, Men.....	17	Total, Men.....	17
Total, Women.....	16	Total, Women.....	16

THIRD YEAR

Music 7—Counterpoint, Canon, and Fugue.....	3	Music 8—Counterpoint, Canon, and Fugue.....	3
Music 44a, 54a, 64a, or 86—Piano, Voice, Violin, or Organ (Major Subject).....	4	Music 44b, 54b, 64b, or 87—Piano, Voice, Violin, or Organ (Major Subject).....	4
Music 46e, 56e, 66e, or 83e—Minor Subject.....	2	Music 24b—Sight Singing.....	1
Music 24a—Sight Singing.....	1	Engl. 2—Survey of English Literature....	4
Educ. 1—Principles.....	4	Music 46f, 56f, 66f, or 83f—Minor Subject.....	2
Engl. 1—Survey of English Literature....	4	Music 94a—Recital.....	1
<hr/>		<hr/>	
Total.....	18	Total.....	15

FOURTH YEAR

Educ. 10—Technics of Teaching.....	3	Music 10—General Theory, Free Compo- sition.....	2
Music 9—General Theory, Free Compo- sition.....	2	Music 45b, 55b, 65b, or 89—Piano, Voice, Violin, or Organ (Major Subject).....	4
Music 11—Acoustics.....	1	Music 46h, 56h, 66h, or 83h—Minor Subject.....	2
Music 45a, 55a, 65a, or 88—Piano, Voice, Violin, or Organ (Major Subject).....	4	Music 94b—Recital.....	1
Music 46g, 56g, 66g, or 83g—Minor Subject.....	2	Music 12—Acoustics.....	1
Engl. 23—Introduction to Shakespeare...	3	Music 27b—Ensemble.....	1
Music 27a—Ensemble.....	1	<hr/>	
<hr/>		Total.....	11
Total.....	16	Total.....	11

NOTE—Students majoring in PUBLIC SCHOOL MUSIC METHODS will in the Fourth Year substitute Music 25a-25b (4) each semester for the practical major, in which case Voice (Music 46a-46b) will be required as the practical minor.

In addition, electives, to make up the prescribed total of 130 hours. These extra credits may be taken at any time; the election made must be approved by the student's adviser.

Courses 41a-41b to 88, 89 include regular attendance in Orchestra or Choral Society unless a student is excused by the Director of the School of Music.

THE COLLEGE OF LAW

Law students should read the General Directions given in paragraphs 1-29 on pages 9-16. Having secured their study-lists (see paragraphs 1-6, pages 9, 10), they should report to their advisers in Room 206, Law Building.

Each student should follow, *point by point*, the directions given on the first coupon of his study-list.

COURSES OFFERED

The University offers two curriculums leading to the degrees of Bachelor of Laws (LL.B.) or Doctor of Law (J.D.):

- (1) A three-year curriculum in law, based on an entrance requirement of two years of college work in liberal arts and sciences.
- (2) A four-year curriculum in law and non-legal electives, based on an entrance requirement of one year of college work in liberal arts and sciences.

THE THREE-YEAR CURRICULUM IN LAW

Admission

For admission to the three-year curriculum as a regular student an applicant must be matriculated and have 60 hours' credit in a college of this University; or have completed two full years of work as given at another college or university of recognized standing, as a matriculated student in such college or university; or have received by transfer 60 hours of university credit here.

Students from other institutions who may fall short of this requirement not to exceed five hours of credit by transfer may be admitted to the three-year curriculum as conditioned students; such conditions to be made up before the beginning of the student's second year in the College.

The Degree of Bachelor of Laws

The degree of Bachelor of Laws (LL.B.) is granted to regularly matriculated students who complete all the courses in the first-year list (see the outline of the curriculum below), the course in Equity (Law 12a-12b), in the second year, the one-hour course in Legal Ethics (Law 26) in the third year, and enough of the other courses to make 84 hours of credit. A student having grades below 75 in subjects aggregating more than twenty-five per cent of his entire work will not be graduated.

The Degree of Doctor of Law

The degree of Doctor of Law (J.D.) is granted to students who comply with the following conditions:

- (1) Complete the work required for the degree of Bachelor of Laws.
- (2) Secure a bachelor's degree in liberal arts and sciences at least two academic years prior to the completion of the courses for the degree of Doctor of Law.
- (3) Obtain a minimum average grade of 85 in the College of Law.
- (4) Present a thesis approved by the faculty of the College of Law.

Curriculum

The program of instruction in law is designed to occupy the student three full years. The most fundamental subjects are presented in the first year, the more specialized and practical topics in the second and third years. The work of the first year, thirty semester hours, is prescribed. The work of the second and third years is elective, except Equity (Law 12a-12b) in the second year and Legal Ethics (Law 26) in the third year. Students are required to elect courses averaging twenty-eight (28) hours for each of these years. The courses elected for either year must ordinarily be chosen from those grouped under the heading for that year. A few subjects are given only in alternate years. The election of courses by any student is in every case subject to the approval of the Dean.

First-year students may not take more than 15 hours without special permission; except that public speaking may be added without such special permission.

Second-year and third-year students may not take more than 15 hours without special permission, unless their work for the preceding semester has averaged 75 or over. If their average has been over 75, 16 hours may be taken.

Curriculum in Law

FIRST YEAR			
FIRST SEMESTER		SECOND SEMESTER	
<i>Prescribed Subjects</i>	Hours ¹	<i>Prescribed Subjects</i>	Hours ¹
Law 1a—Contracts.....	4	Law 1b—Contracts.....	3
Law 2a—Torts.....	3	Law 2b—Torts.....	2
Law 6—Personal Property.....	3	Law 3—Real Property.....	3
Law 5—Criminal Law.....	3	Law 7—Domestic Relations.....	2
Law 37a—Brief Making.....	2	Law 11—Agency.....	3
		Law 37b—Brief Making.....	2
Total.....	15	Total.....	15
SECOND YEAR			
Law 8—Evidence.....	4	Law 12b—Equity.....	2
Law 9—Sales.....	3	Law 18—Wills.....	2
Law 12a—Equity.....	3	Law 10—Titles to Real Property.....	4
Law 15—Bills and Notes.....	3	Law 20—Equity Pleading.....	3
Law 4—Common Law Pleading.....	3	Law 35b—Practise Court.....	1
Law 13—Damages.....	2	Law 16—Trusts.....	3
Law 32—Quasi-Contracts.....	2	Law 33—Restraint of Trade.....	2
Law 19—Partnership.....	2	Law 14—Carriers.....	2
Law 27—Future Interests in Property.....	3		
Law 28—Insurance.....	2		
THIRD YEAR			
Law 15—Bills and Notes.....	2	Law 17—Private Corporations.....	4
Law 22—Constitutional Law.....	4	Law 16—Trusts.....	3
Law 4a—Illinois Procedure.....	3	Law 21—Suretyship.....	3
Law 31—Conflict of Laws.....	3	Law 23—Mortgages.....	2
Law 36a—Practise Court.....	1	Law 36b—Practise Court.....	1
Law 27—Future Interests in Property.....	3	Law 29—Office Practise.....	2
Law 30—International Law.....	3	Law 33—Restraint of Trade.....	2
Law 19—Partnership.....	2		
Law 26—Legal Ethics.....	1		

¹Semester hours. For definition see page 85.

THE FOUR-YEAR CURRICULUM IN LAW AND NON-LEGAL ELECTIVES

Admission

For admission to the four-year curriculum as a regular student, an applicant must be matriculated and have 30 hours' credit in a college of this University, or its equivalent from another college or university of recognized standing. No conditions are permitted for admission to the four-year curriculum.

Graduation Requirement

The degree of Bachelor of Laws is granted to students thus admitted who complete the 84 hours in law required in the three-year curriculum, and in addition thirty hours in other colleges, to be distributed over the four years.

Approximately two-thirds of law work and one-third in subjects other than law are to be taken during the first two years of the four-year curriculum.

SUGGESTED PRE-LEGAL CURRICULUM

The student entering the University with the intention of taking a law course is advised to plan his preliminary college work with great care. He is invited to consult members of the law faculty in regard to his plans. In general the following schedule of studies is recommended by the faculty of the College of Law:

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Hist. 2a—English History.....	3	Hist. 2b—English History.....	3
Rhet. 1—Rhetoric and Themes.....	3	Rhet. 2—Rhetoric and Themes.....	3
Foreign language.....	4	Foreign language.....	4
Mathematics or Chemistry.....	5	Mathematics or Chemistry.....	5
<i>or</i>		<i>or</i>	
Botany 4d—Trees and Shrubs of the Campus.....	3	Zool. 16—Economic Ornithology.....	2
<i>and</i>		<i>and</i>	
Accy. 1a—Principles of Accounting.....	3	Accy. 1b—Principles of Accounting.....	3
P. T. 1 and 1a—Gymnasium and Hygiene..	1	P. T. 2—Gymnasium.....	1
Mil. 1a—Military Drill.....	$\frac{1}{2}$	Mil. 2a—Military Drill.....	$\frac{1}{2}$
Mil. 1b—Military Theory.....	$\frac{1}{2}$	Mil. 2b—Military Theory.....	$\frac{1}{2}$
Total.....	17 or 18	Total.....	17

SECOND YEAR

Econ. 1—Principles of Economics.....	5	Econ. 2—Money and Banking.....	3
Hist. 3a—History of the U. S.....	3	Engl. 20—Chief English Writers.....	4
Philos. 1—Logic.....	3	Hist. 3b—History of the U. S.....	3
Pol. Sci. 1—American National Government	3	Pol. Sci. 3—State and Local Government..	3
Pub. Sp. 1—Oral Expression.....	2	Pub. Sp. 2—Extemporaneous Speaking... 2	
Mil. 3a—Military Drill.....	$\frac{1}{2}$	Mil. 4a—Military Drill.....	$\frac{1}{2}$
Mil. 3b—Military Theory.....	$\frac{1}{2}$	Mil. 4b—Military Theory.....	$\frac{1}{2}$
Total.....	17	Total.....	16

The courses in military, physical training, rhetoric, and foreign language are required of freshmen, and the second-year courses in military of sophomores, in the College of Liberal Arts and Sciences. With these exceptions the above list is intended to be suggestive rather than prescriptive.

¹Semester hours. See definition see page 85.

Latin is strongly urged upon all students intending to study law; but those who have not had the necessary preparation for college courses in Latin should substitute a modern language, preferably French or German. A foreign language begun in college should be pursued for at least two years.

English political and constitutional history is necessary for the understanding of much of the material of legal study. The practical usefulness of courses in public speaking and logic is obvious.

Students who may be interested in mathematics and the physical sciences may properly substitute additional courses in these subjects in the second year. The training in the deduction of principles and their application to the solution of problems which these studies afford is held to be of distinct advantage to prospective students of the law.

Still other suggestions as to suitable electives for pre-legal students may be obtained from the outline of the General Business Curriculum, page 36.

SIX-YEAR COMBINED COURSES

Ordinarily seven years are required to obtain the bachelors' degrees in arts or science and in law, but by a proper selection of studies one may take both degrees in six years. A student who has junior or senior standing in the College of Liberal Arts and Sciences or of Commerce may, subject to the approval of the Dean of the College of Law, elect not less than two of the first-year courses in law, amounting to at least five hours, and count credit therefor both toward the degree of Bachelor of Arts or Bachelor of Science and toward the degrees of Bachelor of Law (LL.B.) or Doctor of Law (J.D.). Students registered in the College of Law may count toward the law degrees six hours of the work offered* by the College of Liberal Arts and Sciences in jurisprudence, international law, and administrative law.

The attention of students is called also to the six-year combined curriculum in Commerce and Law (page 47).

Students in a combined six-year course will need to exercise some care and foresight in order to be able to comply with the requirements of the College of Liberal Arts and Sciences or the College of Commerce as to majors, minors, and group electives within three years.

PRIZES

Eight scholarship prizes are open to matriculated students of the first and second years, to be awarded at the end of each year, four of \$12 each semester and four of \$6 each semester, available in discharge of incidental fees.

The American Law Book Company, of New York, offers an annual prize, consisting of a regular edition of CYC, including supplements, to be awarded to the senior making the best average during his senior year.

Callaghan & Company, law publishers, of Chicago, offer an annual prize, consisting of the Cyclopedic Law Dictionary, to be awarded to the member of the second-year class making the best average during his second year.

THE LIBRARY SCHOOL

Library students should present themselves in Room 320, Library Building, where both their admission and their registration may be completed.

CURRICULUM IN LIBRARY SCIENCE

The curriculum is two years in length. For graduation a student must receive credit for all courses except those marked with an asterisk (*), which are elective. The degree of Bachelor of Library Science is conferred on a student who has completed the required work in the two years' curriculum, and has received credit in courses amounting to 62 hours.

JUNIOR YEAR

FIRST SEMESTER		SECOND SEMESTER	
	Hours ¹		Hours ¹
Lib. Sc. 2a—Reference.....	3	Lib. Sc. 2b—Reference.....	3
Lib. Sc. 3a—Selection of Books.....	2	Lib. Sc. 3a—Selection of Books.....	2
Lib. Sc. 16—Order and Accession.....	2	Lib. Sc. 30—Practise.....	3
Lib. Sc. 17—Classification.....	3	Lib. Sc. 7—History of Libraries.....	2
Lib. Sc. 18—Cataloging.....	3	Lib. Sc. 19—Trade Bibliography.....	1
Lib. Sc. 23a—Library Administration....	1	Lib. Sc. 21—Printing, Binding, Indexing	2
Lib. Sc. 20—Loan Department.....	1	Lib. Sc. 22—Library Extension.....	3
		Lib. Sc. 23a—Library Administration....	1
Total.....	15	Total.....	17

SENIOR YEAR

Lib. Sc. 41a—Subject Bibliography.....	1	Lib. Sc. 41b—Subject Bibliography.....	1
*Lib. Sc. 8—Advanced Reference.....	2	Lib. Sc. 9—History of Books.....	2
Lib. Sc. 40a—Practise.....	3	Lib. Sc. 40b—Practise.....	3
Lib. Sc. 13a—Public Documents.....	2	*Lib. Sc. 13b—Public Documents.....	2
Lib. Sc. 15a—Seminar.....	2	Lib. Sc. 15b—Seminar.....	2
Lib. Sc. 24a—Selection of Books.....	2	Lib. Sc. 24b—Selection of Books.....	2
Lib. Sc. 26a—Library Administration....	3	*Lib. Sc. 29—Advanced Classification....	2
*Lib. Sc. 27—Bibliographical Institutions	1	Lib. Sc. 26b—Library Administration....	3
		*Lib. Sc. 28—Practise.....	1 to 4
Total.....	16	Total.....	18 to 21

Recommended Preliminary Curriculum

Undergraduates who intend, on the completion of their college work, to apply for admission to the Library School, are requested to select their courses so as to conform in general to the following recommended program of studies preparatory to library work.

English literature, 10;² rhetoric, 6.

Latin, 8, in addition to four years of high school Latin.

German, 12, in addition to two years of high school German.

French, 8, in addition to two years of high school French.

¹Semester hours. For definition, see page 85.

²The figure after each subject denotes the minimum number of semester hours which the student should devote to that subject.

German and French begun in college instead of in the high school should be continued for a longer period.

Medieval and Modern European history, 6; history of England, 6; history of the United States, 6.

Economics, 6; political science, 4; sociology, 6.

Philosophy, 4; general psychology, 4.

Zoology, 6; botany, 4; chemistry or physics, 6.

The total of this work is 102 semester hours, leaving the equivalent of one year of a four-year course free for work in other subjects or for more work in the subjects named.

PREPARATION FOR SPECIAL LIBRARIES

Seniors who desire to prepare themselves for work in special libraries (e. g., normal school, historical, business, agricultural) may, with the approval of the faculty, substitute certain advanced courses in other colleges and schools of the University for certain Library School courses.

LIBRARY VISITS AND FIELD WORK

Each year all the students in the Library School are required to visit the libraries and certain of the book binderies, book stores, and printing establishments of either Chicago and vicinity or St. Louis and vicinity. During this visit, which occupies one week, the students are accompanied by a member of the faculty. The expense of this week is about \$20.00.

In order to assure a varied library experience, each student in the senior year is required to spend one month in an assigned library, working, as far as practicable, under the same conditions as a member of the staff of that library. The expense of this month is about \$40.00.

THE SCHOOL OF EDUCATION

GENERAL STATEMENT

The School of Education was established in 1905 as an organization of the various activities of the University which are concerned with the professional preparation of teachers and supervisors for the public schools. The nucleus of the School is the department of education in the College of Liberal Arts and Sciences. The faculty of the School is made up of the members of this department and of other departments which offer courses intended for the preparation of high-school teachers. The Board of Trustees has authorized the construction of a building to be used as a laboratory for the School of Education and to include quarters for a training school of secondary grade. The site on which the first wing of this building is to be erected has been purchased, and the building is now in process of completion.

COMMITTEE ON APPOINTMENT OF TEACHERS

The Committee on Appointment of Teachers recommends qualified graduates of the University for positions as teachers or supervisors in public schools, colleges, and technical schools, in response to requests from the school authorities. The Director of the School of Education is chairman of the Committee, and the Secretary of the School acts as its secretary.

The recommendations of the Committee are made under the following regulations, which were adopted by the University Senate on June 3, 1912:

1. The University Committee on Appointments is authorized to issue its recommendation, signed by the Committee as the agent of the University, in all cases in which it is satisfied with the student's scholarship and ability to teach. The Committee shall regard the scholarship requirements as met if, in addition to carrying the professional courses mentioned in the next paragraph, the student has passed with an average grade of 85 the courses necessary to constitute a major in the principal subject which he wishes to teach, and courses aggregating a minimum varying from six to twelve semester hours (according to subject, and at the discretion of the Committee) in each of the other subjects for which he wishes to be recommended. The Committee shall, however, in each case secure the written opinion of the department concerned in regard to the scholarship of the applicant, and shall view the evidence of scholarship as shown by the records in the light of this opinion; and if there appear to the Committee to be reasons which from their nature cannot be shown by mere records for questioning the scholastic ability of the student, the Committee may in its discretion withhold the recommendation.

2. A candidate must have successfully completed the following courses in the department of education:

- a. An introductory course which shall aim (1) to acquaint the prospective teacher with the public-school system as it exists today in the United States, and (2) to present a brief outline of the principles of education. (A four-hour course.)

- b. A course in the technic of teaching, accompanied by observation of classroom work in secondary schools, and including a discussion of class management (routine and discipline), the elements of school hygiene, and the types of school exercises. (A three-hour course.)

3. The Director of the School of Education may, in his discretion, excuse a candidate from the professional courses outlined above, (1) if the candidate is a normal-school graduate or has taken equivalent courses in a normal school or in another college or university; or (2) if the candidate has had at least one year of successful teaching experience. If, at the time of registration with the Committee on Appointments, the candidate has not completed one of the required courses, but is enrolled at that time in the course, a Committee recommendation may be given with the approval of the instructor in charge of the course.

The courses mentioned in Section 2 are (a) Education 1, Introduction to Education (4 hours), and (b) Education 10, Observation and Technic of Teaching (3 hours). Either course may be taken in either semester.

CERTIFICATION OF HIGH-SCHOOL TEACHERS IN ILLINOIS

A student who expects to teach in the Illinois high schools should bear in mind that all teachers must be duly certificated. County high-school certificates are granted upon examination by county superintendents, and State high-school certificates upon examination by the State Superintendent. For county high-school certificates *issued without examination* the new certificating law makes the following provision:

"At the option of the county superintendent, a high-school certificate may be issued without examination to graduates of a recognized normal school, college, or university, who present, within three years after graduation, certified credits in English, pedagogy, and six high-school subjects (chosen from a list published by the Examining Board) and accompanied by faculty recommendation of ability to teach in the high school." (Section 6.)

The educational courses required for the official recommendation of the University, Education 1 and 10, are accepted as meeting the requirement in pedagogy, and the recommendation of the Committee on Appointment of Teachers satisfies the legal requirement of "faculty recommendation of ability to teach in the high school."

THE GRADUATE SCHOOL

ADMISSION

Admission to the Graduate School may be granted to graduates of institutions whose requirements for the bachelor's degree are substantially equivalent to those of the University of Illinois, and to applicants from other institutions approved by the Executive Faculty. *Admission to the Graduate School does not, however, imply admission to candidacy for an advanced degree, and gives no right or claim to be so admitted. Such candidacy is determined by the Faculty after the student has demonstrated by his work here, for from two to five months, that he has the ability to do major work of graduate character. A mere accumulation of "credits" or "grades" is not sufficient.*

Admission to particular graduate courses or departments may be granted only to those who have had the requisite undergraduate work in those courses or departments. But a student of mature age who satisfies the Dean and the department concerned of his ability to pursue graduate work in a given line may be enrolled in particular graduate courses, and permitted to carry on such study or investigation under the direction of a department of the University as the department shall recommend and the Dean approve.

REGISTRATION

A candidate for admission to the Graduate School should proceed first to the Registrar's Office, 156 Administration Building, taking with him his official statement of credits from the college of which he is a graduate.

At the Registrar's Office he will be asked to fill out in duplicate an "application for admission" and to file therewith his statement of credits.

A candidate from a college or university of recognized standing will receive from the Registrar: (1) a permit to enter; (2) a memorandum of prerequisites to be made up (a blank to be used by his advisers in indicating whether or not he is fully ready to enter upon graduate study in his major and minor subjects); and (3) a study-list.

The candidate should obtain also at the Registrar's Office a copy of the circular of the Graduate School, 1917, and should carefully study the requirements and regulations explained therein, particularly under the headings "Registration and Program of Study" (p. 10) and "Degrees" (p. 13). He should then proceed with his registration in accordance with these requirements and regulations and with the "Directions for Registration" given on the first coupon of his study-list.

UNIVERSITY HONORS

The University gives public official recognition to such students as attain a high grade of scholarship by the following system of honors.

Preliminary Honors

Preliminary Honors are assigned at the completion of the sophomore year on the basis of the average of the grades received during the freshman and sophomore years in all studies except military and physical training. The number of persons to whom honors are awarded may not exceed one-tenth of the membership of the sophomore class. A failure in any subject disqualifies a student from receiving these honors. Preliminary Honors afford an opportunity for sophomores to secure recognition for high scholarship without waiting for graduation.

Final and Special Honors

(Candidates for the Degree of B.S., B.Mus., LL.B., B.L.S.)

Final Honors are assigned on graduation on the basis of the average grades received during the junior and senior years. The number of persons to whom final honors are awarded may not exceed one-tenth of the membership of the senior class. A failure in any subject during the junior and senior years disqualifies a student from receiving these honors. Final honors are designed especially to favor students whose preparatory education has been so imperfect as to prevent them from receiving preliminary honors.

Special Honors are awarded at the close of the senior year. No student may receive such honors who has not completed, before the beginning of his senior year, at least twenty hours' work in the subject, or group of allied subjects, in which the honors are proposed; he must complete thirty hours' work in the same subject, or group of allied subjects, by the end of his senior year, must do such other work as the professor in charge may assign, and must prepare an acceptable thesis. No student is eligible for special honors who, during the senior year, has received a grade of less than eighty in any subject. Special honors are planned for especially brilliant students who prefer to concentrate their efforts on a special subject or group of subjects. A student may be a recipient of both final and special honors.

The Degree of Bachelor of Arts with Honors

The faculty of the College of Liberal Arts and Sciences has been authorized to recommend candidates for the degree of Bachelor of Arts *with honors* in a particular subject. Candidates for the degree with honors will be recommended by the faculty under the following conditions:

- (1) The student must have completed the work offered for his major with an average of not less than 90.
- (2) He must have completed the work offered for his minor with an average of not less than 85.
- (3) Each candidate is required to present a thesis in his major subject.

(4) Especially poor or careless work in any other subject may, by vote of the faculty, cause the honor degree to be withheld.

The purpose of these honors is not to encourage premature specialization, but to give special recognition to students who have pursued with success correlated courses of study, and to emphasize the importance, for scholarship in any subject, of thoro training in other related subjects. Candidates should announce their intention as early as possible in their college curriculum and consult freely with the head of the department concerned in regard to the selection of their studies.

Candidates for the degree of Bachelor of Science in the College of Liberal Arts and Sciences are eligible for final and special honors under the regulations stated on the preceding page.

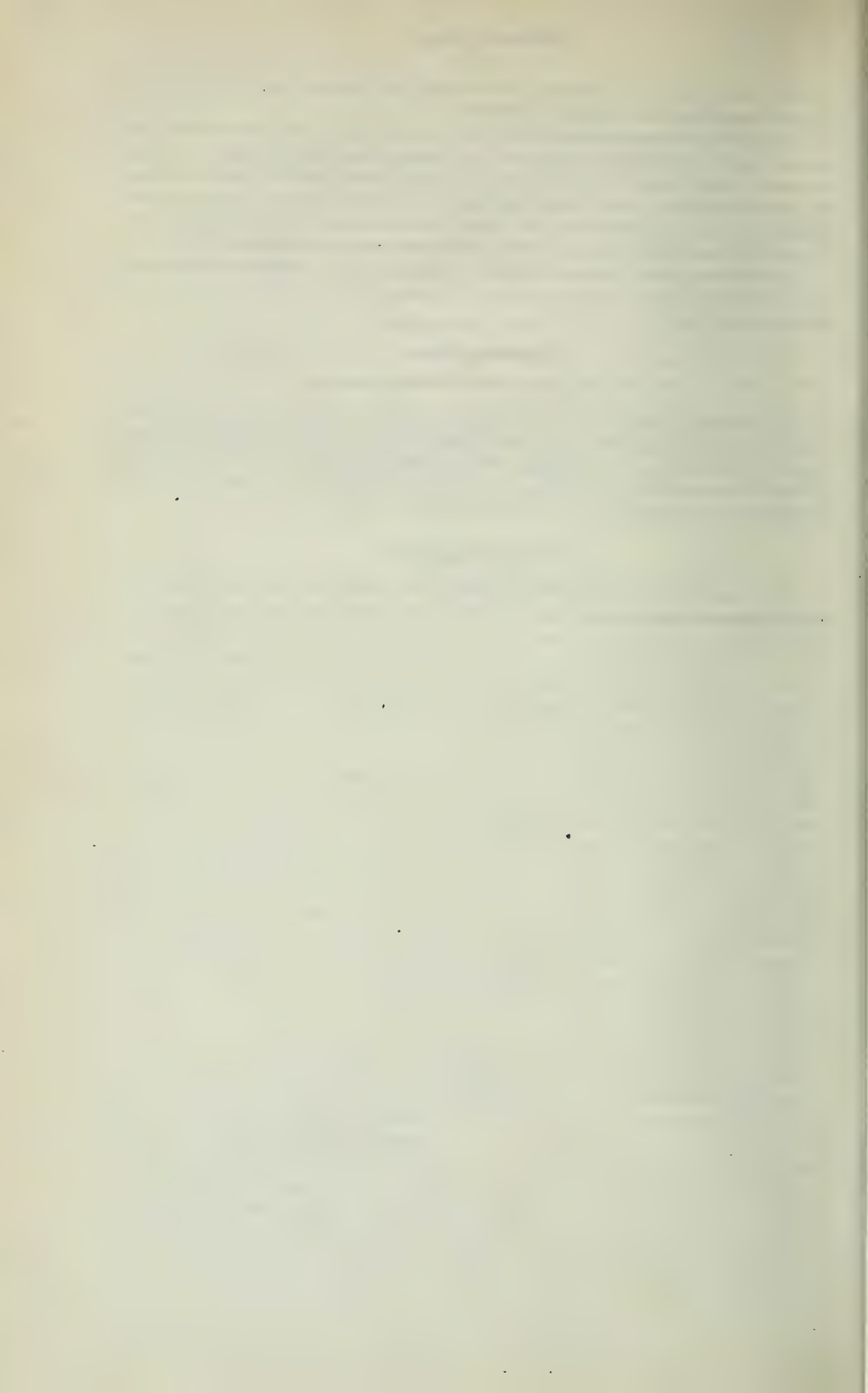
Freshman Honors

(College of Liberal Arts and Sciences)

At the close of each year a list is prepared of those members of the freshman class in the College of Liberal Arts and Sciences who have made an especially good record in scholarship. The names of such students are announced at an assembly of the College; notice is also sent in each case to the parent or guardian, and to the principal of the high school of which the student is a graduate.

List of Honors

The names of the students who receive honors under the foregoing regulations are published in the *Annual Register*.



DESCRIPTION OF COURSES

EXPLANATION

The arrangement of subjects in the following Description of Courses is alphabetical. The connections of allied departments are indicated by cross references.

Following the description of each course of instruction will be found the requirements, if any, for admission to that particular course. The sequence indicated by these prerequisites must be followed. For instance, under Art and Design 7c, Still-life in Oil Colors, the prerequisites given are Art and Design 1 and 2. These two courses must be completed before Course 7c may be taken.

If a course not required for graduation is selected by fewer than five students it may be withdrawn for the semester.

Graduate courses are numbered upwards from 100.

Credit is reckoned, for under-graduate students, in *semester hours*, or simply *hours*. An hour is one class period a week for one semester or the equivalent in laboratory, shop, or drawing room.

The semester, and the number of hours each semester for which the course counts, are shown after each course, thus: *I, II; (2)*. The Roman figures indicate semesters; the Arabic numerals in parenthesis indicate hours of credit for *each semester* for undergraduates.

Credit for first year graduate students, candidates for the master's degree, is counted in units. A unit course is one which requires ten hours of time per week through one semester, irrespective of the distribution of that time in class work, laboratory work, and private study; four such courses or their equivalent constitutes a full minimum program for one semester. The unit values of graduate courses (numbered 100 and upwards) are indicated in the following pages. Courses of the intermediate groups "for graduates and advanced undergraduates," are in general (unless otherwise specified by the department concerned) evaluated as follows for graduate credit: (a) courses open only to students having at least senior standing, 1 unit for a 4-hour or 5-hour course, $\frac{1}{2}$ unit for a 1-hour, 2-hour, or 3-hour course; (b) courses open to juniors, $\frac{1}{2}$ unit for a 4-hour or 5-hour course; $\frac{1}{4}$ unit for a 1-hour, 2-hour, or 3-hour course.

For *second year and third-year graduate students*, candidates for the doctor's degree, no record of units is kept.

The omission of a course for the current year is indicated by enclosing the entire description of such a course in brackets.

The various University buildings are designated by the following abbreviations:

Agricultural Building.....Ag.	Mechanical Engineering Laboratory.....M.L.
Applied Mechanics Laboratory.....L.A.M.	Men's Gymnasium.....Gym.
Astronomical Observatory.....Obs.	Metal Shops.....M.S.
Ceramics Laboratory.....Cer.	Mining Engineering Laboratory.....Min.L.
Chemistry Building.....Ch.	Natural History Hall.....N.H.
Commerce Building.....Com.	Physics Laboratory.....P.L.
Electrical Engineering Laboratory.....E.L.	Stock Judging Pavilion.....S.P.
Engineering Hall.....E.H.	Transportation Building.....T.B.
Farm Mechanics Building.....F.M.	University Hall.....U.H.
Floricultural Greenhouses.....F.G.	Vivarium Building.....V.B.
Horticultural Building.....H.B.	Vegetable Greenhouse.....V.G.
Library.....Lib.	Woman's Building.....W.B.
Lincoln Hall.....L.H.	Wood Shops.....W.S.

ACCOUNTANCY

(See BUSINESS ORGANIZATION AND OPERATION)

AGRICULTURAL EXTENSION

FRED HENRY RANKIN, B.S., *Superintendent and Assistant to the Dean, with rank of Assistant Professor*

ARETAS WILBUR NOLAN, M.S., *Assistant Professor*

ALBERT WOODWARD JAMISON, M.S., *Assistant Professor*

Agronomy

JOSEPH HARVEY CHECKLEY, B.S., *Associate*

ROBERT ENOCH HIERONYMUS, A.M., LL.D., *Community Adviser*

JAMES HENRY GREENE, M.S., *State Leader, Junior Extension*

1. Principles and Methods of High School Agriculture.—Adaptation of agricultural science and practise to high school conditions; order and methods of presentation; laboratory work; apparatus; field work. Practise teaching provided through cooperation with the local high school. *II*; (5).

Prerequisite: Two years' work in agriculture.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Agricultural Extension	1	5	—	3	3	3	3	3	—	553 Ag.	Nolan

3. Agricultural Extension Teachings.—The service of extension enterprises to the people; farmers' institutes; agricultural extension schools; farmers' clubs and cooperative work in rural communities. *II*; (1).

Prerequisite: One year of university work.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Agricultural Extension	3	1	—	—	—	3	—	—	—	Morrow Hall	Rankin Jamison

4. Elementary Agricultural Extension.—Introduction to agricultural college and university work; methods of study; scope and application of agricultural teaching and investigation. Lectures. Required of first-year students. *I*; (1).

(Credit given to agricultural freshmen only.)

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Agricultural Extension	4	1	—	3	—	3	—	—	—	Morrow Hall	Davenport and others

AGRONOMY

CYRIL GEORGE HOPKINS, Ph.D., *Professor, Agronomy*

LOUIE HENRIE SMITH, Ph.D., *Professor, Plant Breeding*

JEREMIAH GEORGE MOSIER, B.S., *Professor, Soil Physics*

WILLIAM LEONIDAS BURLISON, Ph.D., *Associate Professor, Crop Production*

ROBERT STEWART, Ph.D., *Associate Professor, Soil Fertility*

AXEL FERDINAND GUSTAFSON, M.S., *Assistant Professor, Soil Physics*

EARL ARCHIBALD WHITE, M.S., *Assistant Professor, Farm Mechanics*

ALBERT LEMUEL WHITING, Ph.D., *Assistant Professor, Soil Biology*

IRA WILMER DICKERSON, B.S., *Associate, Farm Mechanics*

FREDERICK CHARLES BAUER, B.S., *Associate, Soil Fertility*

CHESTER OTIS REED, B.S., *Associate, Farm Mechanics*

FOREST ADDISON FISHER, B.S., *Associate, Soil Physics*

MARVIN EDWARD JAHR, A.B., *Associate, Farm Mechanics*

FRANK ARCHIBALD WYATT, Ph.D., *Associate, Soil Fertility*

HARRY CHARLES GILKERSON, B.S., *Instructor, Soil Fertility*

HOWARD JOHN SNIDER, B.S., *Instructor, Soil Fertility*

WARREN RIPPEY SCHOONOVER, M.S., *Instructor, Soil Biology*

EDWARD HARVEY WALWORTH, B.S., *Instructor, Crop Production*

ARTHUR MAXWELL BRUNSON, B.S., *Instructor, Plant Breeding*

ROY HANSEN, B.S., *Instructor, Soil Biology*

EDWARD FRITCHOFF TORGERSON, B.S., *Instructor, Soil Physics*

WASHINGTON IRVING BROCKSON, M.S., *Assistant, Crop Production*

RAY IRIS SHAWL, B.S., *Assistant, Farm Mechanics*

1. Drainage.—Drainage and its surveying operations. Chaining, mapping, leveling, designing, setting grade stakes, laying tile, Lectures and drafting first half semester; field work second half semester. *II*; (3).

Prerequisite: Agronomy 9, or its equivalent.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	1	3	—	10, 11	—	10, 11	—	10, 11	—	204 F. M.	Jahr

2. Power Driven Machinery.—Adaptability, construction, principles of operation, adjustment, troubles, purchase, and care of field and belt driven machines for soil, seed, and feed preparation, and for seeding, cultivating, harvesting, and handling farm crops. Lectures, recitations, laboratory practise. *I*; (3).

Prerequisite: Agronomy 26.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	2	3 A, ¹	Lecture	—	—	—	—	8	—	F. M.	Reed
			Laboratory	8, 9	—	8, 9	—	—	—		
			Quiz	—	—	—	—	9	—		
			B, ¹ Lecture	—	1	—	—	—	—		
			Laboratory	—	2, 3	—	2, 3	—	—		
			Quiz	—	—	—	1	—	—		
			C, ¹ Lecture	1	—	—	—	—	—		
			Laboratory	—	—	1, 2	—	1, 2	—		
			Quiz	2	—	—	—	—	—		
			D, ¹ Lecture	—	—	—	8	—	—		
			Laboratory	—	8, 9	—	—	—	10, 11		
			Quiz	—	—	—	9	—	—		

3. Farm Motors.—Internal combustion engines and tractors—theory, ignition, operation, and economy—practise in adjustments, troubles, and testing. The horse as a motor, windmills, waterpower, steam engines, electric motors—their theory, operation, and economy. Transmission of farm power and its application to farm operations. Lectures; quizzes; laboratory. (Alternating with Mechanical Engineering 71 and 73 if desired.) *II*; (3).

Prerequisite: Agronomy 26.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	3	3 A,	Lecture	8	—	—	—	—	—	F. M.	Dickerson
			B, Lecture	1	—	—	—	—	—		
			C, Quiz	—	—	8	—	8	—		
			D, Quiz	—	9	—	9	—	—		
			E, Quiz	—	11	—	11	—	—		
			F, Laboratory	—	1, 2, 3	—	—	—	—		
			G, Laboratory	—	—	1, 2, 3	—	—	—		
			H, Laboratory	—	—	—	—	—	8, 9 10		

4. Farm Buildings.—Construction materials; construction, arrangement, design, and cost estimation of machine sheds, granaries, cribs, silos, poultry houses, swine houses, barns, and farm residences. Recitations and drafting. *I*; (3).

Prerequisite: Agronomy 26.

¹Sections A and B are for students who have had farm experience equivalent to at least two full years of four consecutive seasons each; Sections C and D are for students who have not had such experience.

Agronomy

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	4	3	—	1,2	—	1,2	—	1,2	—	205 F. M.	White

7. Advanced Farm Crops.—Climatic and soil factors in relation to crop production; meadows and pastures; rotation; distribution of labor; cost of production; pure seed production; supply and consumption of products and by-products of farm crops; storage and marketing. Lectures; assigned reading; laboratory; demonstrations. *II*; (3).

Prerequisite: Agronomy 25, Chemistry 13a, and either Botany 3b or an approved equivalent in science (consult instructor).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	7	3	A	2	—	2	—	2	—	455 Ag.	Burlison
			B	—	2	—	2	—	11	455 Ag.	Brockson

8. Special Farm Crops.—Special crops in which the student is interested. Reading; experiments by pot culture in the greenhouse or by plots in the field. Under special arrangement part of this work may be done during summer vacation. *II*; (2 to 5).¹

Prerequisite: Agronomy 7.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	8	2 to 5 ¹	—								Burlison Walworth

9. Soil Physics and Management.—Origin and formation of soil material, mechanical composition and classification; moisture; texture as affecting capillarity; diffusion, temperature, aeration, and as affected by plowing, harrowing, cultivating, rolling, and cropping; wasting by washing, fall or spring plowing and drainage as affecting moisture, temperature, and root development; real and apparent specific gravity, porosity, water holding capacity, and capillary power; the physical effects of different systems of rotation and of continuous cropping with various crops. Lectures; laboratory. *I* or *II*; (5).

Prerequisite: Chemistry 2, and one unit of entrance or university physics.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	9	5	A, Lecture	8	8	8	—	—	—	128 Ag.	Mosier
			A, Quiz	9	—	—	—	—	—	455 Ag.	Gustafson
			A, Laboratory	—	9	9	8,9	8,9	—	650 Ag.	Fisher
			B, Lecture	10	10	10	—	—	—	128 Ag.	Torgerson
			B, Quiz	11	—	—	—	—	—	Morrow	Mosier
										Hall	Gustafson
			B, Laboratory	—	11	11	10,11	10,11	—	650 Ag.	Fisher

SECOND SEMESTER

			Lecture	8	8	8	—	—	—	128 Ag.	Mosier
			Quiz	9	—	—	—	—	—	455 Ag.	Gustafson
			Laboratory	—	9	9	8,9	8,9	—	650 Ag.	Fisher
											Torgerson

10. Special Work in Soil Physics.—Physical properties of special soils; physical analysis; determination of hygroscopic and wilting coefficients and moisture equivalents; effect of tillage on physical factors as related to crop growth in field and green-

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

house. Students may work with special soils. Under special arrangement part of this work may be done during summer vacation. *I* or *II*; (2-5).¹ *Time to be arranged.*

Professor MOSIER, Assistant Professor GUSTAFSON, Mr. FISHER

Prerequisite: Agronomy 9, and approval of the Soil Physics division.

11. Soil Biology.—Quantitative studies of the biochemical activities of soil microorganisms with respect to fertility, factors influencing the bacteria, protozoa, algae, and fungi; isolation and study of organisms; action on insoluble mineral plant food; fermentation of crop residues, green and farm manures; nitrogen fixation, assimilation, and preservation, and similar studies of the other essential elements. Lectures; quiz; laboratory. *II*; (5).

Prerequisite: Agronomy 12 and Bacteriology 1, or 5, or 20, or the equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Agronomy	11	5	Lecture	8	—	8	—	—	—	455 Ag.	Whiting
			Quiz	—	—	—	—	8	—	455 Ag.	Whiting
			A, Lab.	9,10	—	9,10	—	9,10	—	321 Ag.	Schoonover
			B, Lab.	1,2	—	1,2	—	1,2	—	321 Ag.	Hansen

12. Soil Fertility, Fertilizers, Rotations.²—The influence of fertility on yield; effect of different crops on the soil and on succeeding crops; different rotations; ultimate effect of different systems of farming on fertility and productivity; composition and value of manures and fertilizers, soils cropped continuously with different crops and with a series of crops; the fertility of soils of different types from different sections of Illinois.³ Lectures; laboratory. *II*; (5).

Prerequisite: Chemistry 13a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Agronomy	12	5	Lecture	—	8	—	8	—	—	128 Ag.	Hopkins
			A-1, Quiz	—	9	—	9	—	—	553 Ag.	
			A-2, Quiz	—	9	—	9	—	—	122 Ag.	Bauer Wyatt Snider
			B-1, Quiz	—	—	8	—	8	—	553 Ag.	
			B-2, Quiz	—	—	8	—	8	—	Morrow Hall	
			C-1, Quiz	3	—	3	—	—	—	122 Ag.	
			C-2, Quiz	3	—	3	—	—	—	455 Ag.	Bauer Wyatt Snider Gilkerson
			A, Laboratory	8,9	—	8,9	—	8,9	—	218 Ag.	
			B, Laboratory	—	9,10,11	—	9,10,11	—	—	650 Ag.	
			C, Laboratory	—	1,2,3	—	1,2,3	—	—	218 Ag.	

12a. Soil Fertility, Fertilizers, Rotations.²—The same as Agronomy 12, for advanced students. Lectures; quiz. *II*; (2).

Prerequisite: Graduate standing, or advanced undergraduate standing with the approval of the division.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Agronomy	12a	2	Lecture	—	8	—	8	—	—	128 Ag.	Hopkins
			A-1, Quiz	—	9	—	—	—	—	553 Ag.	Wyatt Bauer Snider
			A-2, Quiz	—	—	8	—	—	—	553 Ag.	
			A-3, Quiz	3	—	—	—	—	—	122 Ag.	

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

²A required inspection trip to certain soil experiment fields or farms will be arranged in May or early June, in connection with courses 12 and 12a, which will require an expense of about \$10 on the part of the student.

³The student is advised to collect in advance a representative composite sample of surface soil (at least 6 pounds) from land in which he is interested (see page 44 of the Soil Fertility Laboratory Manual, or Illinois Experiment Station Circular 150).

13. Investigation of the Fertility of Special Soils.—Soils in which the student is interested. Nature and quantity of the elements of fertility; effect of different fertilizers, as determined by pot cultures and by pot experiments; systematic study of similar work of experiment stations and experimenters. *II*; (3).

Prerequisite: Agronomy 12.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	13	3	(Arrange)						218 Ag.	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 5px;">}</div> <div> Stewart Wyatt </div> </div>
		Lecture-Quiz 1—	8	—	—	—	—	—	301 Ag.	
		Lecture-Quiz 2—	8	—	8	—	—	—	301 Ag.	
		Laboratory 1	8,9	—	8,9	—	8,9	—	218 Ag.	
		Laboratory 2	—	1,2	—	—	1,2	8,9	218 Ag.	

14. Seed Inspection and Grain Standardization.—Designed for advanced students who intend to enter the seed or grain business. Advanced work in the inspection of samples of small seeds for purity and germination; sampling, judging, and grading of seeds, grains, and hays. Discussions of seed and grain laws and their application; transportation, marketing, centers of production. Lectures; laboratory. *II*; (2).

Prerequisite: Agronomy 7, or simultaneous registration therein.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	14	2	—	10, 11	—	10, 11	—	—	553 Ag.	Brockson

16. German Agricultural Readings.—The current numbers of German journals of agricultural science used as texts, with special attention to soils and crops. *II*; (2).

Prerequisite: Two years' work in German; Agronomy 12.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	16	2	(Arrange)						214 Ag.	Hopkins

17. Harvesting Machinery.—Expert work on binders, mowers, rakes, loaders, and stackers. For students preparing to become professional field experts on these machines. (Before registering in this course students are requested to consult instructor regarding requirements for successful experting.) *II*; (3).

Prerequisite: M. E. 71; Agronomy 2, and Agronomy 3 or registration therein.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	17	A	8,9	—	8,9	—	8,9	—	F. M.	Reed
		B	—	1,2,3	—	1,2,3	—	—	F. M.	Reed

18a-18b. Investigation or Thesis.—*I, II*; (5-10).¹

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Agronomy	18a	5 to 10 ¹	—	(Arrange)						}	Hopkins
											Mosier
											Smith
											Stewart
											Burlison
SECOND SEMESTER											Whiting
Agronomy	18b	5 to 10 ¹	—	(Arrange)							

19a-19b. Research Work in Farm Mechanics.—Consult instructor regarding time and requirements. *I, II*; (1-5).¹

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FIRST SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Agronomy	19a	1 to 5 ¹	—						(Arrange)
SECOND SEMESTER									
Agronomy	19b	1 to 5 ¹	—						(Arrange)

Instructor
White
Dickerson
Jahr
Reed

20. Farm Concrete Construction.—Materials used in concrete construction; mixing and placing; simple comparative tests; specifications and estimates for farm concrete construction. Recitations; laboratory. *II*; (2).

SECOND SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Agronomy	20	2	A	—	10,11	—	10,11	—	204 F. M.
			B	—	1,2	—	1,2	—	204 F.M.

Instructor
Jahr
Jahr

22. Plant Breeding.—The improvement by breeding of field crops, including grains, grasses, and legumes; general principles involved, with practical applications. Lectures, assigned reading, demonstrations, and laboratory.

(Schedule is so arranged that this course may be taken in conjunction with Agronomy 7.) *II*; (2).

Prerequisite: Botany 1; Chemistry 13a; Agronomy 25.

SECOND SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Agronomy	22	2	—	1,2	—	1,2	—	—	600 Ag.

Instructor
Smith
Brunson

23. Plant Food Supplies.—The world's supply of plant-food materials; utilization and conservation. *II*; (2).

Prerequisite: Agronomy 12.

SECOND SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Agronomy	23	2	—	8	—	8	—	—	316 Ag.

Instructor
Stewart

25. Farm Crops.—Plant growth; structure; principles governing the production and harvesting of common farm crops; habits, characteristics, requirements, means of improvement; common diseases, insects, and their control; weed seed identification; methods of weed control; seed testing for purity and germination; market grades of grain; grain judging. *I* or *II*; (4).

EITHER SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Agronomy	25	4 A, Lecture	9	—	9	—	—	—	128 Ag.
		Quiz	—	—	—	—	9	—	128 Ag.
		Laboratory	—	8,9	—	8,9	—	—	600 Ag.
		B, Lecture	2	—	2	—	—	—	128 Ag.
		Quiz	—	—	—	—	2	—	128 Ag.
		Laboratory	—	1,2	—	1,2	—	—	600 Ag.
		C, Lecture	11	—	11	—	—	—	553 Ag.
		Quiz	—	—	—	—	11	—	553 Ag.
		Laboratory	—	10, 11	—	10, 11	—	—	600 Ag.

[Instructor
Burlison
Walworth
Brockson

26. Elementary Farm Mechanics.—Ropes, soldering, babbitting, belt lacing, pipe cutting, plumbing, sewage disposal, farm water systems, lighting systems, heating systems, power transmission, elementary mechanics, and equalizers. Design of a farm shop. *I* or *II*; (3).

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Agronomy

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Agronomy	26	3	A, Quiz	—	8	—	—	3	—	201 F. M.	White
			Drafting	—	9	—	—	—	—		
			Laboratory	—	—	—	8,9	—	—		
			B, Quiz	—	—	10	—	10	—		
			Drafting	—	—	—	—	11	—		
			Laboratory	10,11	—	—	—	—	—		
			C, Quiz	—	1	—	1	—	—		
			Drafting	—	—	—	2	—	—		
			Laboratory	—	2,3	—	—	—	—		
			D, Quiz	8	—	—	—	8	—		
			Drafting	9	—	—	—	—	—		
			Laboratory	—	—	8,9	—	—	—		
Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Agronomy	26	3	A, Quiz	—	8	—	—	3	—	201 F. M.	White
			Drafting	—	9	—	—	—	—		
			Laboratory	—	—	—	8,9	—	—		
			B, Quiz	10	—	10	—	—	—		
			Drafting	—	—	11	—	—	—		
			Laboratory	—	—	—	10, 11	—	—		
			C, Quiz	—	1	—	1	—	—		
			Drafting	—	—	—	2	—	—		
			Laboratory	—	2,3	—	—	—	—		
			D, Quiz	8	—	—	—	8	—		
			Drafting	9	—	—	—	—	—		
			Laboratory	—	—	8,9	—	—	—		

27. Drainage Design.—Designing of tile drainage systems from level note data and contour maps; estimating sizes, amounts, and cost of tile, and cost of system; designing of outlet open ditch system for drainage districts; estimation of sizes and costs; drainage district laws; preparing bids on contract jobs; advanced field work. *I*; (1.5)¹.

Prerequisite: Agronomy 1, or Civil Engineering 96, 31, or 32.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Agronomy	27	1 to 5 ¹	—	(Arrange)						205 F. M.	Jahr

Courses for Graduates

101. Soil Investigations.—Systems of soil investigations; sources of error and methods of control; interpretation of results. *Twice a week; I or II; (1 unit).*

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Argronomy	101	1 unit	—	(Arrange)						316 Ag.	Stewart

104. Seminar in Agronomy.—Critical study by graduate students, faculty, and staff members of current literature on the subject of soils and crops. *Once a week; I, II; (½ unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Agronomy	104	½ unit	—	(Arrange)						301 Ag.	Whiting and others

112. Plant Breeding.—A detailed study of experiments at this station; methods and results reported from other states and from foreign countries. *I, II; (½ to 2 units).*

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Animal Husbandry

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Agronomy	112 ½ to 2 units	—							110 Ag.	Smith

114. Crop Production.—Crop ecology, methods and results of crop production investigations. *Once a week; I, II; (½ to 2 units).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Agronomy	114 ½ to 2 units	—							604-A	Burlison

118. Investigations.—A special problem is chosen by each student. Consultation one to five times a week for different students. *I, II; (1 to 4 units).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Agronomy	118 1 to 4 units	—							Ag.	Hopkins
										Smith
										Stewart
										Mosier
										Whiting
										Burlison

ANIMAL HUSBANDRY

(Including FARM ORGANIZATION AND MANAGEMENT)

HERBERT WINDSOR MUMFORD, B.S., *Professor, Animal Husbandry*
 HARRY SANDS GRINDLEY, D.Sc., *Professor, Animal Nutrition*
 WALTER CASTELLA COFFEY, M.S., *Professor, Sheep Husbandry*
 ROBERT GRAHAM, D.V.M., B.S. in Agriculture, *Professor, Animal Pathology*
 JAMES LLOYD EDMONDS, B.S., *Assistant Professor, Horse Husbandry*
 HENRY PERLY RUSK, M.S., *Assistant Professor, Cattle Husbandry*
 JOHN A. DETLEFSEN, D.Sc., *Assistant Professor, Genetics*
 WALTER FREDERICK HANDSCHIN, B.S., *Assistant Professor, Farm Organization and Management.*
 HAROLD HANSON MITCHELL, Ph.D., *Associate, Animal Nutrition*
 WILLIAM HERSCHEL SMITH, M.S., *Associate, Animal Husbandry*
 DANIEL OTIS BARTO, B.S., *Associate, Animal Husbandry*
 WILBUR JEROME CARMICHAEL, M.S., *Associate, Animal Husbandry*
 GILBERT GUSLER, B.S., *Associate, Animal Husbandry*
 SLEETER BULL, M.S., *Associate, Animal Nutrition*
 ROY HAROLD WILCOX, B.S., *Associate, Animal Husbandry*
 ELMER ROBERTS, Ph.D., *Instructor, Genetics*
 JAMES WILBUR WHISENAND, M.S., *Assistant, Animal Husbandry*
 JAMES BURTON ANDREWS, B.S., *Instructor, Farm Organization and Management*
 CLAUDE HARPER, B.S., *Instructor, Animal Husbandry*
 EARL KIRKWOOD AUGUSTUS, B.S., *Assistant, Animal Husbandry*
 MARY HELEN KEITH, A.M., *Assistant, Animal Nutrition*
 JOHN BENJAMIN RICE, B.S., *Assistant, Animal Husbandry*
 HENRY CARL ECKSTEIN, B.S., *Assistant, Animal Nutrition*
 JAMES BRUCE HENDERSON, M.S., *Assistant, Animal Husbandry*

Courses for Undergraduates

Beef Cattle: Animal Husbandry 11a, 11b.

Breeding, Feeding, Management, and Marketing: Animal Husbandry 8, 21, 28, 29, 30, 32, 33; Farm Management 1.

Animal Husbandry

General Judging: Animal Husbandry 1a, 2a, 4a, 5, 11a, 22.

Genetics: Animal Husbandry 30.

Horses: Animal Husbandry 4a, 4b.

Meat: Animal Husbandry 10, 24.

Nutrition: Animal Husbandry 7, 7a, 31.

Poultry: Animal Husbandry 23.

Sheep: Animal Husbandry 1a, 1b, 27.

Swine: Animal Husbandry 2a, 2b, 26.

NOTE—Students registered in advanced courses such as 10, 22, 23, 28, 29, 32, and Farm Management 1, are required to participate in tours of inspection of representative markets, farms, herds, flocks, and studs.

1a. Sheep: Breeds and Market Classes.—Breeds used for mutton and wool production; types, characteristics, and adaptability; market classes and grades of sheep and wool. Lectures; judging. *I*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	1a	2	—	—	10, 11	—	10, 11	—	—	S. P.	Coffey Harper

1b. Sheep: Breeding, Feeding, and Management.—Pure bred and grade flocks; feeding, housing, and shepherding. Lectures; reference readings. *I*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 1a and 1b the same semester.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	1b	3	—	10	—	10	—	10	—	Morrow Hall	Coffey Harper

2a. Swine: Breeds and Market Classes.—History of the leading breeds; types, characteristics, and adaptability; market classes and grades; market reports. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	2a	2	—	—	10, 11	—	10, 11	—	—	S. P.	Carmichael Rice

2b. Swine Husbandry.—Economic production of market and breeding hogs. Breeding, feeding, housing, care, sanitation, common diseases, and marketing. Lectures; assigned reading; quizzes. *II*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 2a and 2b the same semester.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	2b	3	—	10	—	10	—	10	—	128 Ag.	Carmichael Rice

4a. Market Classes of Horses and Mules and Breeds of Horses.—Market classes, grades, and requirements. History of the leading breeds; types, characteristics, and adaptability. Lectures; judging. *II*; (2).

Prerequisite: Animal Husbandry 5, or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	4a	2	—	—	1,2	—	1,2	—	—	S. P.	Edmonds

4b. Breeding, Feeding, and Management of Horses.—Care of stallions, mares, and foals; of work horses and drivers at labor and idle; fattening horses for market. Lectures; assigned readings. *II*; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 4a and 4b the same semester.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	4b	3	—	1	—	1	—	1	—	S. P.	Edmonds

5. Fundamentals of Live Stock Judging.—Names and location of external parts of the various kinds of live stock; use of the score card, comparative judging, breed identification, and types of farm animals. Required in the freshman year. *I* or *II*; (3).

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	5	3	A	8,9	—	8,9	—	8,9	—	S.P.	Gusler and others
			B	10,11	—	10,11	—	10,11	—	S.P.	

7. Principles of Animal Nutrition.—Composition of feedingstuffs and the chemistry of food nutrients; digestion and the determination of digestibility; absorption and metabolism of organic and inorganic nutrients; the function of fats, carbohydrates, proteins, and ash constituents in nutrition; energy, metabolism and the fuel value of the feeding stuffs; regulating factors in metabolism; food requirements and feeding standards; the specific value of different feeds in nutrition. Lectures; recitations; laboratory. *I*; (5).

Prerequisite: Animal Husbandry 21; Chemistry 13a.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	7	5	Lecture	—	—	11	—	—	—		Grindley Mitchell
			Quiz	11	—	—	—	11	—	455 Ag.	
			Lab.	—	10,11	—	10,11	—	—	503 Ag.	

7a. Principles of Animal Nutrition.—The same as Animal Husbandry 7, for advanced students. Lectures; recitations. *I*; (3).

Prerequisite: Graduate standing, or qualified undergraduates of junior or senior standing. Undergraduates before registering in this course must secure the approval of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal Husbandry	7a	3	Lecture	—	—	11	—	—	—		Grindley Mitchell
			Quiz	11	—	—	—	11	—	455 Ag.	

8. Principles of Breeding.—Elemental facts of evolution and genetics; origin of domesticated animals and plants; history of systematic breeding; the relation to genetics of old and new theories of breeding. Required in the sophomore year. *I* or *II*; (1).

NOTE—See Animal Husbandry 21.

Animal Husbandry

Subject	No. Credits	Section	EITHER SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Animal Husbandry	8	1 Lecture	—	—	—	8	—	—	S. P.	Detlefsen Roberts and others
		A, Quiz	—	—	—	—	8	—	122 Ag.	
		B, Quiz	—	—	—	—	8	—	301 Ag.	
		C, Quiz	—	—	—	—	9	—	122 Ag.	
		D, Quiz	—	—	—	—	9	—	301 Ag.	
		E, Quiz	—	—	—	—	—	10	122 Ag.	
		F, Quiz	—	—	—	—	—	10	301 Ag.	
		G, Quiz	—	—	—	—	1	—	122 Ag.	

9. Investigation and Thesis.—I or II; (5-10).¹

Subject	No. Credits	Section	EITHER SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Animal Husbandry	9	5 to 10 ¹ —	—	—	—	—	—	—	(Arrange)	Heads of divisions

10. Meat.—Farm butchering, curing, and care of meats; yield, quality, and values of meat and by-products, as related to breeding, feeding, and health of animals; classes, grades, and cuts of meat in wholesale and retail markets.

The class will leave on its annual Chicago trip, Thursday morning, March 28, 1918. The cost will be about \$8.00. II; (3).

Prerequisite: Two years of university work.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Animal Husbandry	10	3 —	—	8	—	8	—	—	122 Ag.	Augustus
		Lab.	—	—	—	—	—	8,9	S. P.	

11a. Beef Cattle.—Breeds and market classes; history of the leading breeds; beef type from the standpoint of the butcher, the feeder, and the breeder; classification and value of each grade according to current market reports. Judging; lectures; quizzes; assigned readings. I; (2).

Prerequisite: Animal Husbandry 5 or its equivalent.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Animal Husbandry	11a	2 —	—	1,2	—	1,2	—	—	S. P.	Rusk

11b. Beef Production.—Breeding and management of pure bred herds; breeding for the market; combined beef and milk production, economic factors in cattle feeding; influence of age, grade, breed, condition, and sex; equipment; pork and manure as by-products of beef production. Lectures; quizzes; assigned readings (text book). I; (3).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalents.

It is advisable to take 11a and 11b simultaneously.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Animal Husbandry	11b	3 —	2	—	2	—	2	—	S. P.	Rusk

15. Dairy Cattle.—(See Dairy Husbandry 2 and 16.)

21. Principles of Feeding.—Classification, digestibility, and functions of feed nutrients; classification and values of feeding stuffs; feed requirements and calcula-

¹In registering for a course with variable credit hours a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., but 2-5, but 2, or 3, or 4, or 5.

tion of balanced rations for farm animals. Required in the sophomore year. *I* or *II*; (2).

Prerequisite: Chemistry 1 or 1a; Chemistry 2; Animal Husbandry 5; and registration in Animal Husbandry 8.

NOTE—To arrange his schedule most efficiently the student should register in the same section as in Animal Husbandry 8.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal	21	2	Lecture	—	8	—	—	—	—	S. P.	Bull
Husbandry			A, Quiz	8	—	8	—	—	—	122 Ag.	Bull Whisenand and others
			B, Quiz	8	—	8	—	—	—	301 Ag.	
			C, Quiz	9	—	9	—	—	—	122 Ag.	
			D, Quiz	9	—	9	—	—	—	301 Ag.	
			E, Quiz	—	10	—	10	—	—	122 Ag.	
			F, Quiz	—	10	—	10	—	—	553 Ag.	
			G, Quiz	1	—	1	—	—	—	122 Ag.	

22. Advanced Stock Judging.—Animal conformation, quality, and condition with reference to market and show yard requirements; selection of horses, beef cattle, sheep, and swine, for feed lot, market, and exhibition; judging at live stock shows. The class will make an inspection trip to various live stock farms about the middle of October. The cost will not exceed \$15.00. *I*; (3).

Prerequisite: Animal Husbandry 1a, 2a, 4a, 11a, or their equivalents.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal	22	3	—	3	3	3	3	3	—	S. P.	Mumford
Husbandry											and heads of divisions

23. Poultry: Types, Breeds, and Varieties.—Exhibiting and judging; principles of breeding; poultry houses and equipment; feeding, hatching, and brooding; market eggs and poultry; crate-fattening and dressing; diseases and their treatment. A limited number of short trips will be taken, the total cost of which will not exceed \$10.00. *II*; (5).

Prerequisite: Animal Husbandry 5, or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Animal	23	5	—	11	11	11	11	11	—	S. P.	Barto
Husbandry											

24. Meat.—Influence of type, condition, age, sex, and feeds on the yield and market grade of meat products. *II*; (2-5)¹. *Time to be arranged.*

Professor COFFEY

Prerequisite: Animal Husbandry 10, and 1a or 2a or 11a; three years' work in the University, or its equivalent.

26. Swine Husbandry.—Special problems. *II*; (2-5).¹ *Time to be arranged.*

Mr. CARMICHAEL

Prerequisite: Animal Husbandry 2a, 2b, three years' work in the University, or its equivalent.

27. Sheep Husbandry.—Factors determining the importance of the industry in leading sheep growing countries, particularly different parts of the United States. *II*; (2-5).¹ *Time to be arranged.*

Professor COFFEY

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Animal Husbandry

Prerequisite: Animal Husbandry 1a, 1b; three years' work in the University, or its equivalent.

28. Advanced History of Breeds of Live Stock.—Horses, beef cattle, sheep, and swine. Methods of great breeders; performances and pedigrees of famous animals; breed type as exemplified in the University and other herds. Lectures; assigned readings; problems. The class will make an inspection trip to various live stock farms about the middle of October. The cost will not exceed \$15.00. *I*; (3-5).¹

Breeds offered, 1917-18

Beef cattle.....Herefords, Galloways
Horses.....Shires, Clydesdales, American Saddlers
Swine.....Poland Chinas, Chester Whites
Sheep.....Rambouillets, Oxford Downs

Prerequisite: "a" and "b" courses in class of live stock elected. See note at the beginning of the description of animal husbandry courses.

Breeds offered, 1918-1919

Beef cattle.....Shorthorns, Aberdeen Angus
Horses.....Percherons, Belgians, Standard breeds
Swine.....Berkshires, Duroc Jerseys
Sheep.....Shropshires, Southdowns

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	28	3 to 5 ¹	—	9	—	9	—	9	—	553 Ag.
										Instructor Mumford and heads of divisions

29. Systems of Live Stock Farming.—Management, climate, soil, topography, location with-reference to markets; the supply of land, labor, capital, and managing ability as factors in influencing the choice and adaptation of systems of production. Planning of farms for mixed and live stock systems. The class will visit some of the farms included in the Farm Management investigations being conducted by the department. This trip will cost about \$15.00. *II*; (2).

Prerequisite: Animal Husbandry 5, 8, and 21, and 6 hours' credit from 1b, 2b, 4b, or 11b; Farm Management 1. See note at beginning of description of animal husbandry courses.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	29	2	—	8	—	8	—	—	—	107 Gen.
										Instructor Handschin Wilcox

30. Genetics.—Heredity, variation, elements of biometry, and their practical application to breeding. Lectures; demonstrations; laboratory. *II*; (5).

Prerequisite: Two years of university work. Before registering, students must secure the approval of the instructor.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	30	5	—	11	11	11	11	11	—	107 Gen.
										Instructor Detlefsen Roberts

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 1-2, but 1, or 2.

31. Advanced Course in Animal Nutrition.—Some of the more advanced phases of the chemistry and physiology of nutrition; recent developments on the nature of growth, the factors affecting metabolism, and the food requirements of animals under different conditions; nutrition investigations of agricultural experiment stations in this and other countries. Lectures; quizzes; assigned readings. *II*; (3). *Time to be arranged.*

Dr. MITCHELL

Prerequisite: Animal Husbandry 7, 7a; an elementary knowledge of organic chemistry is also desirable.

32. Marketing Live Stock.—Markets and methods of marketing live stock and their products. Advertising and sale of surplus pedigreed live stock. Certain inspection trips will be required of the class. The expense of these trips will be about \$15.00. *II*; (2).

Prerequisite: Two years of university work. At least 4 credits in Animal Husbandry 1a, 2a, 4a, and 11a. See note at beginning of description of animal husbandry courses.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	32	2	—	—	9	—	9	—	—	128 Ag.
										Instructor
										Mumford
										Wilcox

33. Animal Husbandry Practicums.—Designed to give a working knowledge of the operations necessary in the barn and stable management of live stock. One hour credit will be given for each two classes of live stock elected. *II*; (1-2).¹

Prerequisite: Limited to senior students specializing in Animal Husbandry.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Animal Husbandry	33	1 to 2 ¹	—	—	—	—	—	—	8,12	S. P.	Heads of divisions
											(Mornings and evenings as required by instructor.)

34. Anatomy and Physiology of Farm Animals.—The structure and function of the animal economy (horse and cow) in health, supplemented by a discussion of the common malformations and diseases affecting the various organs and systems of the animal. Lectures; assigned readings; quizzes. *I*; (2).

Prerequisite: Sixty hours of university work.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	34	2	—	3	—	3	—	—	—	553 Ag.
										Instructor
										Graham

35. Contagious Diseases of Farm Animals.—The cause, symptoms, and methods of prevention of the common diseases of animals transmissible to man. A discussion of antiserums, vaccines, antitoxins, and bacterins, as well as other biological products as related to the prevention, cure, and diagnosis of animal diseases. This class will make an inspection trip to Chicago. The cost will be about eight dollars (\$8.00). Lectures; assigned readings; quizzes. *II*; (2).

Prerequisite: Animal Husbandry 34.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Animal Husbandry	35	2	—	3	—	3	—	—	—	553 Ag.
										Instructor
										Graham

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 1-2, but 1, or 2.

Animal Husbandry

Courses for Graduates

Students entering graduate work in animal husbandry must have a thorough training in the fundamental principles of the subject either in connection with or in addition to an agricultural course of study substantially equivalent to that offered in this University.

103. Live Stock Experimentation.—Objects, methods, and the sources of error in experimental work dealing with the feeding, breeding, and management of farm animals. *Once a week; I, II; (½ unit). Time to be arranged.* Professor DAVENPORT

110. Animal Nutrition.—Biochemistry, digestion, metabolism, and nutritive value of the proteins. Lectures; seminar. *Twice a week; I, II; (1 unit).*

Professor GRINDLEY, Dr. MITCHELL

[111. Animal Nutrition.—Biochemistry, digestion, metabolism, and nutritive value of the fats and lipoids, the carbohydrates, and the inorganic substances. Lectures; seminar. *Twice a week; I, II; (1 unit).* Alternates with Animal Husbandry 110. (Not given, 1917-1918.)

Professor GRINDLEY, Dr. MITCHELL]

112. Research.—Opportunity is afforded to pursue investigations along the following lines:

- (a) Economic factors involved in meat production.

Professor MUMFORD, Professor COFFEY, Assistant Professor RUSK

- (b) Systems of live stock farming.

Assistant Professor HANDSCHIN

- (c) The valuation of pedigrees.

Professor MUMFORD

(d) Animal Nutrition. The chemistry of feeding stuffs; metabolism experiments and biochemical studies connected with the nutrition of farm animals.

Professor GRINDLEY, Dr. MITCHELL

- (e) Genetics. Problems in heredity and variation.

Assistant Professor DETLEFSEN

- (f) Factors affecting the quality, quantity, strength, and condition of wool.

Professor COFFEY

(a), (b), (c), and (f), *one to three times a week; (d) and (e) once a week; I, II; (1 to 2 units). Time to be arranged.*

117. Genetics.—Study and criticism of genetic experiments, biological and mathematical methods employed, and the validity of the conclusions. *Three to five times a week; I, II; (1 to 2 units). Time to be arranged.*

Assistant Professor DETLEFSEN

FARM ORGANIZATION AND MANAGEMENT

1. Elementary Farm Management.—The factors of production in the farm business; systems of farming, their distribution and adaptation; farm organization; the distribution of capital invested; planning of the farm; farm administration or operation; planning of work; handling of labor; development of management efficiency. Lectures; quiz. The trip required in this course is the same as in Animal Husbandry 29. *II; (3).*

Prerequisite: Three semesters of required work; Economics 1 or 2 and Accountancy 1 or 11.

It is also very important that the student have credit or be registered in Agronomy 12, and have at least 6 hours credit in Animal Husbandry 1b, 2b, 4b, or 11b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Farm Management	1	3	—	2	—	2	—	2	—	128 Ag.	Handschin Andrews

ARCHITECTURE

LORING HARVEY PROVINE, B.S., A.E., *Professor*
 NATHAN CLIFFORD RICKER, D.Arch., *Professor, Emeritus*
 NEWTON ALONZO WELLS, M.P., *Professor, Architectural Decoration*
 JAMES McLAREN WHITE, B.S., *Professor, Architectural Engineering, Supervising Architect*
 PERCY ASH, B.S., C.E., *Assistant Professor, Architectural Design*
 WILLIAM CALDWELL TITCOMB, A.B., B.S., *Assistant Professor, Architecture*
 CHARLES RICHARD CLARK, B.S., M.Arch., *Assistant Professor, Architectural Construction*
 ROBERT TAYLOR JONES, B.S., *Associate, Architecture*
 RHODES ROBERTSON, A.B., M.Arch., *Associate, Architectural Design*
 WILLIAM SIDNEY WOLFE, B.S., M.S., *Instructor, Architectural Engineering*
 RALPH STANLEY FANNING, B.S., *Instructor, Architectural Design*
 WILLIAM MACEY STANTON, B.S., M.S., *Instructor, Architectural Design*
 CARL VICTOR BURGER, B.Arch., *Instructor, Freehand Drawing*
 LEMUEL CROSS DILLENBACK, A.M., *Instructor, Architectural Design*
 RALPH EDWARD MUEHLMAN, *Instructor, Architectural Design*
 OWEN J T SOUTHWELL, M.S., *Instructor, Architectural Design*
 CYRUS EDMUND PALMER, M.S., *Instructor, Architectural Engineering*
 JOSEPH EDWIN BURGESS, B.P., *Instructor, Freehand Drawing*
 WINIFRED FEHRENKAMP, B.L.S., *Librarian*

13, 14, 15, 16. History of Architecture.—From the Egyptian period to modern times; effects of political, economic and local conditions; influence of material, climate, structural systems, the various countries and periods; evolution of architectural forms. Illustrated lectures; quizzes. *I, II; (2).*

Prerequisite: Sophomore standing in architecture or architectural engineering, or Architecture 31 and 32.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Architecture	13	2	A B	11	—	11	—	—	—	221 E. H.	Ash
			C D	9	—	9	—	—	—	221 E. H.	Ash
SECOND SEMESTER											
Architecture	14	2	A B	11	—	11	—	—	—	221 E. H.	Ash
			C D	9	—	9	—	—	—	221 E. H.	Ash
FIRST SEMESTER											
Architecture	15	2	A B	—	9	—	9	—	—	221 E. H.	Ash
			C D	—	2	—	2	—	—	221 E. H.	Ash
SECOND SEMESTER											
Architecture	16	2	A B	—	9	—	9	—	—	221 E. H.	Ash
			C D	—	2	—	2	—	—	221 E. H.	Ash

23-24. Freehand Drawing.—Charcoal drawing from the cast. Water color work. *Six hours drawing a week. I, II; (2).*

Prerequisite: Architecture 32.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Architecture	23	2	A	1-4	—	1-4	—	—	—	405 E. H.	Burger
			B	8-11	—	8-11	—	—	—	405 E. H.	Burger
SECOND SEMESTER											
Architecture	24	2	Schedule same as for Architecture 23 (first semester).								

Architecture

25. Freehand Drawing.—Principles underlying arrangement of form and color; rhythm and sequence; harmony and contrast. *Six hours drawing a week. I; (2).*

Prerequisite: Architecture 23-24.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Architecture	25	2	A	—	1-4	—	1-4	—	406 E. H.	Burger
			B	—	—	1-4	—	1-4	406 E. H.	Wells

26. Freehand Drawing.—Charcoal, pen, pencil, and water color drawing from the cast and from still life. Out-of-door sketching. *Six hours drawing a week. II; (2).*

Prerequisite: Architecture 23-24.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Architecture	26	2	A	—	1-4	—	1-4	—	406 E. H.	Burger
			B	—	—	1-4	—	1-4	406 E. H.	Wells

27. Freehand Drawing.—Sketching from still life; study of proportions. *Six hours drawing a week. I; (2).*

Prerequisite: Architecture 25-26.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Architecture	27	2	A	—	8-11	—	8-11	—	406 E. H.	Wells
			B	—	1-4	—	1-4	—	406 E. H.	Wells

28. Freehand Drawing.—Water color; original decorative composition; out-of-door sketching. *Six hours drawing a week. II; (2).*

Prerequisite: Architecture 25-26.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Architecture	28	2	A	—	8-11	—	8-11	—	406 E. H.	Wells
			B	—	1-4	—	1-4	—	406 E. H.	Wells

31. Architectural and Freehand Drawing.—Instruments, pen, pencil, and brush; lettering; shades and shadows; perspective. Charcoal drawing from the cast. *One lecture and ten hours drawing a week. I; (4).*

Prerequisite: Registration in General Engineering Drawing 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Architecture	31	4	A	—	—	—	—	3	—	221 E. H.	Muehlman Fanning Burgess
			A	—	—	—	—	1-3	10-12	405 E. H.	
			A	1-4	—	1-4	—	—	—	214 E. H.	
			B	—	—	—	—	3	—	221 E. H.	
			B	10-12	—	—	—	10-12	—	405 E. H.	
			B	—	1-4	—	1-4	—	—	214 E. H.	
For students taking	{		C	—	—	—	—	3	—	221 E. H.	
Landscape			C	—	—	8-10	—	—	8-10	405 E. H.	
Gardening			C	8-11	—	—	—	8-11	—	214 E. H.	
			D	—	—	—	—	3	—	221 E. H.	
			D	8-10	—	—	—	8-10	—	405 E. H.	
			D	—	8-11	—	8-11	—	—	214 E. H.	

32. Architectural and Freehand Drawing.—Elements of architecture; walls, moldings, doors, windows, the Orders, vaults, roofs, stairs. Wash rendering, stereotomy, charcoal drawing from the cast. Lectures and sketching. *One lecture and ten hours of drawing a week. II; (4).*

Prerequisite: Architecture 31.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	32	4	A	—	—	—	—	3	—	221 E. H.	Muehlman Panning Burgess
			A	—	—	—	—	1-3	10-12	405 E. H.	
			A	1-4	—	1-4	—	—	—	—	
For students taking Landscape Gardening {	B	—	—	—	—	3	—	221 E. H.			
	B	10-12	—	—	—	10-12	—	405 E. H.			
	B	—	1-4	—	1-4	—	—	—			
	C	—	—	—	—	3	—	221 E. H.			
	C	—	—	8-10	—	—	8-10	405 E. H.			
	C	8-11	—	—	—	8-11	—	—			
	D	—	—	—	—	3	—	221 E. H.			
	D	8-10	—	—	—	8-10	—	405 E. H.			
	D	—	8-11	—	8-11	—	—	—			

33-34. Design.—(Elementary.) Rendered order and sketch problems involving simple composition; library research in elements of composition. *One lecture and nine hours of drawing a week. I, II; (3).*

Prerequisite: Architecture 31, 32.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	33	3	A	—	—	—	—	8	—	221 E. H.	Titcomb Stanton Robertson
			A	—	1-4	—	1-4	—	8-11	319 E. H.	
			B	—	—	—	—	8	—	221 E. H.	
			B	1-4	—	1-4	—	1-4	—	319 E. H.	

Architecture 34 3 Sections and schedule the same as for 33 (first semester).

35-36. Design.—(Intermediate.) Rendered plan and sketch problems; library research in plan and interior elements. *Fifteen hours of drawing a week. I, II; (5).*

Prerequisite: Architecture 33-34.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	35	5	A	8-11	—	—	—	—	8-11	319 E. H.	Titcomb Stanton Robertson
			A	1-4	—	1-4	—	1-4	—	319 E. H.	
			B	8-11	—	—	—	—	8-11	319 E. H.	
			B	1-4	1-4	—	1-4	—	—	319 E. H.	

Architecture 36 5 Sections and schedule the same as for 35 (first semester).

37. Design.—(Advanced.) Original design. *Twenty-one hours of drawing a week. I; (7).*

Prerequisite: Architecture 35-36.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	37	7	A	8-11	—	8-11	—	8-11	8-11	408 E. H.	} Titcomb Stanton Robertson
			A	1-4	—	1-4	—	1-4	—	408 E. H.	
			B	8-11	—	8-11	—	8-11	8-11	408 E. H.	
			B	1-4	—	1-4	—	1-4	—	408 E. H.	

38. Advanced Design or Thesis.—An extended original problem in design or construction. *Twenty-one hours of drawing a week. II; (7).*

Prerequisite: Architecture 37.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	38	7	A B	8-10	—	8-10	—	8-11	8-11	408 E. H.	Titcomb Stanton Robertson
			A B	1-4	—	1-4	—	1-4	—	408 E. H.	

Architecture

43. Working Drawings.—The growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; detailing various parts on a large scale; floors, walls, roofs, doors, windows, cornices, stairs, wainscoting, cabinet-work, interior finish; preparation of working drawings. Kidder: *Building Construction, Part II*. Two lectures and four hours of drawing a week. I; (3).

Prerequisite: General Engineering Drawing 2; Architecture 31, 32.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Architecture	43	3	A	—	10	—	10	2	—	305 E. H.	<div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 3em; vertical-align: middle;">}</div> <div style="display: inline-block; vertical-align: middle;"> Jones Fanning </div> </div>
			A	8-10	—	8-10	—	—	—	319 E. H.	
			B	—	10	—	10	10	—	305 E. H.	
			B	—	2-4	—	2-4	—	—	319 E. H.	

44. Working Drawings.—Materials for stone masonry; their uses, defects, qualities, and preparation; kinds of masonry and external finish; tools for stone cutting; brick masonry, its materials and bonds; terra cotta design, manufacture, and use; columns, beams, girders, and footings; joints and connections. Working drawings. Kidder: *Building Construction and Superintendence, Part I*. Two lectures and four hours drawing a week. II; (3).

Prerequisite: General Engineering Drawing 2; Architecture 31, 32, 43.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Architecture	44	3	A	—	10	—	10	2	—	108 P. L.	<div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 3em; vertical-align: middle;">}</div> <div style="display: inline-block; vertical-align: middle;"> Jones Fanning </div> </div>
			A	8-10	—	8-10	—	—	—	319 E. H.	
			B	—	10	—	10	10	—	108 P. L.	
			B	—	2-4	—	2-4	—	—	319 E. H.	

45. Graphic Statics.—Elementary Graphic Statics; its application to trussed roofs, steel and masonry arches, domes. The graphical representation of reactions, bending moments, shear and deflection in beams. (For architects.) Ricker: *Notes on Graphic Statics*. One lecture and six hours of drawing a week. I; (3).

Prerequisite: Theoretical and Applied Mechanics 14, 15, 16.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Architecture	45	3	A B	—	10	—	10	—	—	400 E. H.	<div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 3em; vertical-align: middle;">}</div> <div style="display: inline-block; vertical-align: middle;"> Clark Palmer </div> </div>
			A B	—	—	8-11	—	8-11	—	319 E. H.	

46. Roofs.—Wooden and steel roofs; determination of section of members; design of joints; mill and steel skeleton construction. One lecture and six hours of drawing a week. II; (3).

Prerequisite: Architecture 45.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Architecture	46	3	A B	—	10	—	10	—	—	400 E. H.	<div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 3em; vertical-align: middle;">}</div> <div style="display: inline-block; vertical-align: middle;"> Clark Palmer </div> </div>
			A B	—	—	8-11	—	8-11	—	319 E. H.	

55. Building Sanitation.—Plumbing, trap ventilation, removal of wastes; water closets; drains and systems of water supply; sewage disposal; water supply and fixtures in dwellings. (For architects.) Cosgrove: *Principles and Practice of Plumbing*. Recitations; lectures; designs for special problems. II; (1).

Prerequisite: Physics 9a-9b, 10a-10b; Architecture 43, 44.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Architecture	55	1	A B	—	8	—	—	—	—	108 P. L.	Jones

59. Domestic Architecture.—(Given in connection with Household Science 2.) Lectures; criticism. *I. Time to be arranged.*

Assistant Professor ASH, Assistant Professor CLARK

60. Special Lectures.—Special lectures on architectural subjects. (For architects.) *II; (1).*

Prerequisite: Senior standing.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	60	1	A	10	—	10	—	—	208 P. L.	—

65-66. Theory of Architecture.—Influence of function on architectural form; plan and elevation; problem analysis. Lectures; research; exercises. *I, II; (1).*

Prerequisite: Registration in Architecture 25, 26.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	65	1	A B	11	—	—	—	—	202 E. H.	Wells

SECOND SEMESTER

Architecture 66 1 Sections and schedule the same as for 65 (first semester).

67. Theory of Form.—Principles underlying arrangement of form; architectural ornament and composition, proportion and balance. *Six hours of drawing a week. II; (2).*

Prerequisite: Senior standing in architecture.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	67	A	—	1-4	—	1-4	—	—	408 E. H.	Burgess
		B	—	8-11	—	8-11	—	—	408 E. H.	Burgess

68. Specifications.—General and special clauses and their arrangement; classifying material to facilitate writing specifications; practise in writing several sets; relations of the architect, owner, and builder; office organization; building ordinances; professional ethics. (For architects.) *II; (3).*

Prerequisite: Senior standing in architecture.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Architecture	68	3	A	11	—	11	—	11	400 E. H.	Provine

99. Inspection Trip.—*I; (no credit). Time to be arranged.*

Prerequisite: Senior standing.

Courses for Graduates

Entrance on graduate work in architecture presupposes the full undergraduate course in that subject. Semi-weekly conferences are held and additional instruction given in all courses as may be required.

101. Architectural Construction.—Design of special structures. *I, II; (½ to 1 unit). Time to be arranged.* Professor RICKER, Professor PROVINCE

102. Sanitation of Buildings.—The planning of sanitation, warming, and ventilation. *I, II; (¼ to ½ unit). Time to be arranged.*

Professor RICKER, Assistant Professor CLARK

Architectural Engineering

103. Advanced Architectural Graphics.—Graphic statics. Unusual types of footings, columns, and trusses. *I or II; (1 to 2 units). Time to be arranged.*

Professor RICKER, Professor PROVINCE

104. Architectural Design.—Advanced course. *I or II; (1 to 4 units). Time to be arranged.*

Assistant Professor ASH

105. Architectural Practise.—Contracts, specifications, and office methods; architectural jurisprudence. *I or II; ($\frac{1}{4}$ to $\frac{1}{2}$ unit). Time to be arranged.*

Professor RICKER, Professor PROVINCE

106. Advanced Architectural History.—Special research. *I or II; ($\frac{1}{2}$ to 2 units). Time to be arranged.*

Professor RICKER

ARCHITECTURAL ENGINEERING

33. Architectural Drawing.—Lettering; elements of architecture; walls, mouldings, doors, windows, shades and shadows, perspective, the Orders, vaults, roofs, stairs; wash rendering, stereotomy, charcoal, drawing from the cast. Lectures and sketching. *Nine hours of drawing a week. I; (3).*

Prerequisite: General Engineering Drawing 1, 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	33	3	C	—	—	—	—	1	—	400 E. H.	Southwell
			C	1-4	—	1-4	—	2-4	—	319 E. H.	
			D	—	—	—	—	1	—	400 E. H.	
			D	—	1-4	—	1-4	—	10-12	319 E. H.	

34. Design.—(Elementary.) Rendered order and sketch problems; library research. *Nine hours of drawing a week. II; (3).*

Prerequisite: Architectural Engineering 33.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	34	3	C	—	—	—	—	1	—	400 E. H.	Southwell
			C	1-4	—	1-4	—	2-4	—	319 E. H.	
			D	—	—	—	—	1	—	400 E. H.	
			D	—	1-4	—	1-4	—	10-12	319 E. H.	

35-36. Design.—(Intermediate.) Rendered plan and sketch problems; library research. *Nine hours of drawing a week. I, II; (3).*

Prerequisite: Architectural Engineering 33, 34.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	35	3	C	11	—	—	—	—	—	208 P. L.	Dillenback
			C	8-11	—	8-11	—	8-11	—	319 E. H.	
			D	11	—	—	—	—	—	319 E. H.	
			D	—	8-11	—	8-11	—	8-11	—	

SECOND SEMESTER

A. E. 36 3 Sections and schedule the same as for 35 (first semester).

43. Working Drawings.—The growth, cutting, seasoning, working, and finishing of woods; structural and decorative properties; floors, walls, roofs, doors, windows, cornices, stairs, wainscoting, cabinet-work, interior finish; preparation of working drawings. (For architectural engineers.) *One recitation and three hours of drawing a week. I; (2).*

Prerequisite: Architectural Engineering 31; General Engineering Drawing 2.

Architectural Engineering

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
A. E.	43	2	C	—	—	—	—	9	—	400 E. H.
			C	—	—	—	1-4	—	—	319 E. H.
			D	—	—	—	—	9	—	400 E. H.
			D	—	—	1-4	—	—	—	319 E. H.

44. Working Drawings.—Materials for stone masonry; their uses, defects, qualities, and preparation; kinds of masonry and external finish; tools for stone cutting; brick masonry; bonds; terra cotta design, manufacture, and use; columns, beams, girders; joints and connections; preparation of working drawings. *One recitation and three hours of drawing a week.* II; (2).

Prerequisite: Architectural Engineering 33, 43; General Engineering Drawing 1, 2.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
A. E.	44	2	C	—	—	—	—	9	—	400 E. H.
			C	—	—	—	1-4	—	—	319 E. H.
			D	—	—	—	—	9	—	400 E. H.
			D	—	—	1-4	—	—	—	319 E. H.

45. Graphic Statics.—Elements, and applications to forces; beams under fixed and moving loads. *One lecture and six hours of drawing a week.* I; (3).

Prerequisite: Theoretical and Applied Mechanics 20; registration in Theoretical and Applied Mechanics 25.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
A. E.	45	3	C	2	—	2	—	—	—	400 E. H.
			C	—	8-11	—	8-11	—	—	319 E. H.
			D	2	—	2	—	—	—	—
			D	8-11	—	8-11	—	—	—	319 E. H.

46. Advanced Graphic Statics.—The analysis of masonry arches, domes, and vaults; large and unusual forms of roof trusses. *One lecture and six hours of drawing a week.* II; (3).

Prerequisite: Architectural Engineering 45.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
A. E.	46	3	C	2	—	2	—	—	—	400 E. H.
			C	—	8-11	—	8-11	—	—	319 E. H.
			D	2	—	2	—	—	—	400 E. H.
			D	8-11	—	8-11	—	—	—	319 E. H.

47. Architectural Engineering.—Design and working drawings of trusses, members and joints, plate girders, chimneys; investigations of wind bracing. *Fifteen hours of drawing a week or the equivalent.* I; (5).

Prerequisite: Theoretical and Applied Mechanics 26; Architectural Engineering 44, 46.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
A. E.	47	5	C	8-11	1-4	8	1-4	8-11	—	407 E. H.
			D	1-4	9-12	1	9-12	1-4	—	407 E. H.

48. Architectural Engineering.—Design and detail of footings; investigation of framed structures; working drawings. *Fifteen hours of drawing a week or the equivalent.* II; (5).

Prerequisite: Architectural Engineering 47.

Art and Design

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	48	5	C	8-11	1-4	8	1-4	8-11	—	407 E. H.	} Wolfe
			D	1-4	9-11	1	9-12	1-4	—	407 E. H.	

57. Fireproof Construction.—Principles and design of fireproof construction; the advantages of each type. *Two lectures or recitations a week. I; (2).*

Prerequisite: Theoretical and Applied Mechanics 26; Architectural Engineering 44, 46; registration in Architectural Engineering 47.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	57	2	C	—	9	—	9	—	—	400 E. H.	} Clark
			D	—	2	—	2	—	—	400 E. H.	

58. Fireproof Construction.—(Continuation of first semester's work.) Details and working drawings. *Six hours of drawing a week. II; (2).*

Prerequisite: Architectural Engineering 47, 57; registration in Architectural Engineering 46.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	58	2	C	—	9-11	—	9-12	—	—	407 E. H.	} Clark
			D	—	1-4	—	1-4	—	—	407 E. H.	

67. Building Sanitation.—Plumbing, trap ventilation, removal of wastes; water closets; drains and systems of water supply; sewage disposal; water supply and fixtures in all types of buildings. (For architectural engineers.) Cosgrove: *Principles and Practice of Plumbing*. Recitations, lectures and quizzes; designs for special problems. *II; (2).*

Prerequisite: Physics 1a-3a, 1b-3b, Architectural Engineering 43 and 44.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	67	2	C D	—	8	—	8	—	—	—	} Jones

68. Estimates and Specifications.—Methods of estimating, illustrated by problems; a study of specifications, their general and special clauses, and arrangement; relations of architect, owner, and builder. (For architectural engineers.) *Four recitations a week. II; (4).*

Prerequisite: Senior standing in architectural engineering.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
A. E.	68	4	C D	11	11	11	—	11	—	400 E. H.	Provine

99. Inspection Trip.—*I; (no credit). Time to be arranged.*

Prerequisite: Senior standing.

ART AND DESIGN

EDWARD JOHN LAKE, B.S., *Assistant Professor*

CHARLES EARL BRADBURY, B.P., *Associate*

MARY MINERVA WETMORE, *Instructor*

GIDEON ROBERT FORBES, M.L.A., *Instructor*

1. Freehand Drawing.—Practise drawing in charcoal and pencil; perspective principles with application; light, shadows, shade, and reflections in monochrome; lectures and reference reading on graphical representation. *I or II; (3).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Art and Design 1	1	3	A	8,9	—	8,9	—	8,9	—	406 U. H.	Bradbury
			B	10,11	—	10,11	—	10,11	—	406 U. H.	Lake
			C	1,2	—	1,2	—	1,2	—	406 U. H.	Bradbury
			D	—	10,11	—	10,11	—	10,11	406 U. H.	Forbes
				SECOND SEMESTER							
			A	8,9	—	8,9	—	8,9	—	406 U. H.	Lake
			B	1,2	—	1,2	—	1,2	—	406 U. H.	Forbes

2. Advanced Freehand Drawing.—Drawing in tone; study of values, composition, and technical expression. Outdoor sketching. *II*; (2).

Prerequisite: Art and Design 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	2	2	—	1,2	—	1,2	—	1,2	—	403 U. H.	Bradbury

3a-3b. Anatomical Representation.—Practise drawing from plaster models and from life; lectures on proportion, construction, composition and action in the representation of the human figure. Either semester may be taken separately. *I*, *II*; (3).

Prerequisite: Art and Design 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 3a	3		—	10,11	—	10,11	—	10,11	—	403 U. H.	Bradbury

Art and Design 3b 3 Schedule the same as for 3a (first semester).

4a-4b. Water Color Painting.—Practise painting of still-life; flowers, and sketching out-doors, with application to pictorial and decorative art. *I*, *II*; (3).

Prerequisite: Art and Design 1, 2.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 4a	3	—	1-4	—	1-4	—	1-4	—		407 U. H.	Wetmore

Art and Design 4b 3 Schedule the same as for 4a (first semester).

5a-5b. Drawing from Life.—Drawing in monochrome from life, with application to pictorial and decorative purposes. *I*, *II*; (3).

Prerequisite: Art and Design 1, 3a or 3b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 5a	3	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore	

Art and Design 5b 3 Schedule the same as for 5a (first semester).

6a-6b. Portrait in Oil Colors.—Painting in oil colors from costumed model, with especial attention to portrait and character study. *I*, *II*; (3).

Prerequisite: Art and Design 1, 3a or 3b, 5a-5b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design	6a	3	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

Art and Design 6b 3 Schedule the same as for 6a (first semester).

Art and Design

6c. Portrait in Oil Colors.—(Advanced course.) A continuation of 6a-6b. *II*; (3).

Prerequisite: Art and Design 1, 3a or 3b, 5a-5b.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Art and Design 6c	3	—	10,11	—	10,11	—	10,11	—	408 U. H.	Wetmore

7a-7b. Still-Life in Oil Colors.—Practise painting of still-life; flowers and sketching out-doors in oil colors, with application to pictorial and decorative art. *I, II*; (3).

Prerequisite: Art and Design 1, 2.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Art and Design 7a	3	—	1-4	—	1-4	—	1-4	—	408 U. H.	Wetmore

Art and Design 7b 3 Schedule the same as for 7a (first semester).

7c. Still-Life in Oil Colors.—(Advanced course.) A continuation of Art and Design 7a-7b. *II*; (3).

Prerequisite: Art and Design 1, 2.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Art and Design 7c	3	—	1-4	—	1-4	—	1-4	—	408 U. H.	Wetmore

8a-8b. Modeling.—Clay modeling of anatomical and decorative forms; the making of plaster molds and models; relative study of sculptural art. *I, II*; (3).

Prerequisite: Art and Design 1.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Art and Design 8a	3	—	—	1-4	—	1-4	—	—	Basement Law Building	Lake

Art and Design 8b 3 Schedule the same as for 8a (first semester).

10. Sketching.—Practise in various mediums: pen, pencil, wash, charcoal, pastel; special attention to the requirements for reproduction. Study of technical methods in sketching from still-life, landscape, and figure. *II*; (1).

Prerequisite: Art and Design 1.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Art and Design 10	1	—	—	—	—	—	—	10,11	406 U. H.	Bradbury

12. Design.—The theory and practise of design; lectures on the theory of pure design and the effect of material on execution; the fitness of various forms of media for different sorts of design; space division and space relations; the theory of color; color schemes and exercises; conventionalization of natural forms for various functions; practise in execution. *I* or *II*; (2).

Prerequisite: Art and Design 1.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Art and Design 12	2	Lecture	10	—	—	—	—	—	410 U. H.	Forbes
		A,Conference	—	—	10,11	—	—	—	402 U. H.	Forbes
		B,Conference	—	—	—	—	10,11	—	402 U. H.	Forbes

SECOND SEMESTER

Lecture	10	—	—	—	—	410 U. H.	Forbes
A,Conference	—	—	10,11	—	—	402 U. H.	Forbes
B,Conference	—	—	—	—	10,11	402 U. H.	Forbes
C,Conference	—	10,11	—	—	—	402 U. H.	Forbes
D,Conference	—	—	—	10,11	—	402 U. H.	Forbes

14. Applied Design.—(Practise.) Organic design as applied in crafts as stencil, batik, block printing, wood carving, painted boxes, leather applique, embroidery, etc., or in commercial art, as posters, bookplates, book-covers; conventional landscape painting. *I* or *II*; (3).

Prerequisite: Art and Design 1, 12.

EITHER SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 14	3	—	—	1,2	—	—	1,2	—	402 U. H.	Forbes

19. History of the Fine Arts.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting previous to the Italian Renaissance. *I*; (2).

Prerequisite: One year of college work.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 19	2	—	3	—	3	—	—	—	410 U. H.	Lake

20. History of the Fine Arts.—A study of the expression of the periods and styles of the arts of architecture, sculpture, and painting of the Italian Renaissance and to the present time. *II*; (2).

Prerequisite: One year of college work.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Art and Design 20	2	—	3	—	3	—	—	—	410 U. H.	Lake

ASSYRIAN

(See ORIENTAL LANGUAGES AND LITERATURE)

ASTRONOMY

JOEL STEBBINS, Ph.D., *Professor*

FRANK WALKER REED, Ph.D., *Instructor*

No major for undergraduates is offered in astronomy. Students may well make mathematics or physics their major, and take Astronomy 7, 8, 14, and 15 as a minor.

Upper classmen without mathematical training may elect Astronomy 1. Astronomy 4 is for beginners but requires trigonometry. A student may not receive credit for both courses.

Courses for Undergraduates

1. Elementary Astronomy.—Lectures; recitations; one evening a week at the observatory. *I*; (3).

Prerequisite: Sophomore standing.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Astronomy	1	3	—	—	11	—	11	—	228 N. H.	Stebbins

Bacteriology

3. Astronomy for Engineers.—Rough and accurate determinations of latitude, azimuth, and time, especially with the ordinary surveyor's transit; the art of computing. *II*; (3).

Prerequisite: Junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Astronomy	3	3	—	—	10,11	—	10,11	—	10,11	Obs.	Stebbins

4. General Astronomy.—Lectures; recitations; two evenings a week at the observatory. *II*; (5).

Prerequisite: Mathematics 4.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Astronomy	4	5	—	9	9	9	9	9	—	L. H.	

For Advanced Undergraduates and Graduates

7-8. Theoretical Astronomy.—Celestial mechanics; theory of orbits; perturbations; canonical transformations. *I, II*; (3). *Time to be arranged.*

Dr. REED

Prerequisite: Mathematics 9.

14. Observational Astronomy.—The working methods of an astronomical observatory; individual problems. *II*; (3). *Time to be arranged.*

Prerequisite: Astronomy 15.

15. Geodetic Astronomy.—The sextant, transit, and zenith telescope; methods similar to those of the United States Coast Survey. *I*; (3). *Time to be arranged.*

Prerequisite: Mathematics 7.

Courses for Graduates

101. Seminar and Thesis.—*Three times a week; I, II; (1 unit). Time to be arranged.*

Professor STEBBINS

102. Stellar Astronomy.—Orbits of binary stars; variable stars; theoretical photometry. *Three times a week. I, II; (1 unit.) Time to be arranged.*

Professor STEBBINS

BACTERIOLOGY

(See also BOTANY)

JOEL ANDREW SPERRY, 2d, Ph.D., *Associate*

FRED WILBUR TANNER, Ph.D., *Instructor*

WARREN MCALLISTER DEACON, A.B., *Assistant*

STEPHEN ALBERT WALSER, B.S., *Assistant*

NOTE.—No major is offered for the present in bacteriology for undergraduates.

1. Elementary Bacteriology.—Laboratory methods; technic and observations on the morphology and general physiology of bacteria and allied microorganisms. Open only to students in the College of Agriculture and the Medical Course. *I*; (3).

Prerequisite: Chemistry 3a.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Bacteriology	1	3	Laboratory	—	1,2	—	1,2	—	10,11	367 Ch.	Sperry

5. Introductory Bacteriology.—Morphology and physiology of bacteria and related microorganisms; technic of cultivation and observation. *I* or *II*; (5).

Prerequisite: Chemistry 2a.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Bacteriology	5	5	Lecture	10	—	10	—	—	—	100 Ch.	Tanner
			A, Quiz	11	—	11	—	—	—	103 Ch.	Walser
			B, Quiz	1	—	1	—	—	—	103 Ch.	Walser
			A, Laboratory	8,9	—	8,9	—	8,9	—	267 Ch.	Deacon
			B, Laboratory	—	8,9	—	8,9	—	8,9	267 Ch.	Deacon

6. Bacteriology for Sanitary Engineers.—Bacteriological and microscopical methods applied to the examination of water and sewage. Theories of filtration, sterilization, and filter control. *I*; (2½).

Prerequisite: Chemistry 10b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Bacteriology	6	2½	Laboratory	—	1,2	—	1,2	—	10,11	360 Ch.	Sperry

8. Applied Bacteriology.—Decay of organic matter in nature; soil and sewage bacteria; food bacteria; water bacteria; pathogenic bacteria. Laboratory; lectures; assigned readings; reports. *II*; (5).

Prerequisite: Bacteriology 5 or its equivalent; Chemistry 9.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Bacteriology	8	5	Lecture	—	—	8	—	8	—	103 Ch.	Tanner
			Laboratory	—	8,9	—	8,9	—	8,9	103 Ch.	Walser

Courses for Advanced Undergraduates and Graduates

18a-18b. Journal Meeting.—Required of all graduate students who major in general and pathological bacteriology. *I, II*; (1).

Prerequisite: Bacteriology 5, or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Bacteriology	18a	1	—	—	—	—	—	11	—	366 Ch.	Sperry

SECOND SEMESTER				
Bacteriology	18b	1	Schedule same as for Bacteriology 18a (first semester).	

20. General Bacteriology.—(For advanced students, and graduate students who do not major in bacteriology). Laboratory methods, technic of cultivation and observation and study of biochemical reactions. Laboratory; lectures; assigned readings; reports from Lafar: *Handbuch der technischen Mykologie*, and Kruse: *Allgemeine Mikrobiologie*. Replaces Bacteriology 19. *I*; (5).

Prerequisite: Two years of college chemistry and senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Bacteriology	20	5	Lecture	11	—	11	—	—	—	115 Ch.	Tanner
			Laboratory	—	8,9	—	8,9	—	8,9	367 Ch.	Tanner

Bacteriology

26. Pathological Bacteriology.—Cultural and morphological characteristics of disease-producing organisms. Theories of immunity and serum reactions. Routine diagnostic procedure. *II*; (3).

Prerequisite: Bacteriology 1 or 5; junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	26	3	Laboratory	2,3	—	2,3	—	2,3	—	360 Ch.	Sperry

27. Epidemiology.—The ways in which communicable diseases are spread; methods of control. Lectures; assigned readings and reports. *I*; (2).

Prerequisite: Bacteriology 5; junior standing.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Bacteriology	27	2	Lecture	—	11	—	11	—	—	—	Sperry

Courses for Graduates

The work outlined below is open only to graduate students who have had at least one year's work in bacteriology, and satisfactory training in chemistry.

103. Physiology of Bacteria.—The facts and theories of fermentation and growth and death of bacteria. *I*; (1 unit).

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Bacteriology	103	1 unit	Lectures	—	8	—	—	—	—	366 Ch.	Sperry
			Laboratory							365 Ch.	Sperry

105. Classification of Bacteria.—Variability of species; characters; mutations; standard and biometrical classifications. *II*; (1 unit).

SECOND SEMESTER											Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S			
Bacteriology	105	1 unit	Lectures	—	8	—	—	—	—		366 Ch.	Sperry
			Laboratory								365 Ch.	—

107. Research in Bacteriology.—This course is designed especially for those students who are taking a major in bacteriology either for the doctor's degree or the master's degree. Thesis work may be taken in any of the fields in bacteriology indicated below. *Once a week; I, II; (½ to 4 units). Time to be arranged.*

General Bacteriology	Doctor SPERRY
Dairy Bacteriology	Professor HARDING
Pathogenic Bacteriology	Doctor SPERRY
Plant Pathology	Professor STEVENS
Water and Sewage Bacteriology	Professor BARTOW

See also the following: Agronomy 118; Botany 106; Chemistry 110; Dairy Husbandry 104; Dairy Husbandry 105; Dairy Husbandry 106; Agronomy 11; Botany 22a-22b; Chemistry 10a; Dairy Husbandry 11; Dairy Husbandry 12a-12b.

BANKING

(See ECONOMICS)

BIOLOGY

(See BOTANY, ENTOMOLOGY, PHYSIOLOGY, and ZOOLOGY)

BOTANY

(See also BACTERIOLOGY)

WILLIAM TRELEASE, D.Sc., LL.D., *Professor*
 CHARLES FREDERICK HOTTES, Ph.D., *Professor*
 FRANK LINCOLN STEVENS, Ph.D., *Professor*
 JOEL ANDREW SPERRY, 2d, Ph.D., *Associate, (Bacteriology)*
 STELLA MARY HAGUE, Ph.D., *Instructor*
 WALTER BYRON MCDUGALL, Ph.D., *Instructor*
 FRED WILBUR TANNER, Ph.D., *Instructor, (Bacteriology)*
 NORA ELIZABETH DALBEY, A.M., *Assistant*
 FORREST ELLWOOD KEMPTON, M.S., *Assistant*
 WILLIAM EUGENE PICKLER, A.B., *Assistant*
 LEE ELLIS MILES, A.B., *Assistant*
 RICHARD ALONZO GANTZ, A.B., *Assistant*
 TRUMAN G YUNCKER, A.M., *Assistant*
 MARY EMMA RENICH, A.M., *Assistant*
 PEARL FOREST GROVE, A.B., *Assistant*
 DUDLEY JAMES PRATT, A.M., *Assistant*
 AARON RAYMOND KIENHOLZ, B.S., *Research Assistant*
 WARREN MCALLISTER DEACON, A.B., *Assistant, (Bacteriology)*
 STEPHEN ALBERT WALSER, B.S., *Assistant, (Bacteriology)*
 RAY NELSON, M.S., *Graduate Assistant*

Major: 20 hours exclusive of Botany 1, and 4, made up of courses grouped along one of six lines, according to the suggestions given below.

Minor: 20 hours chosen from chemistry, entomology (exclusive of 1a and 1b), geology, physics, physiology, and zoology, in consultation with the department of botany. At least eight hours must be offered in one subject.

Courses offered are of four types; the first intended to meet the needs of beginners; the second laying a foundation for methods of accuracy in observation, manipulation, and experimentation through the study of some fundamentally important subdivision of the science; the third giving practise in methods of investigation by the study of advanced problems varied to suit the needs and interests of the student; and the fourth teaching independent research by means of thesis subjects leading to the discovery of new facts or laws.

The work of any semester may be credited separately except when a problem is left incomplete in one of the courses open to graduates.

For the convenience of undergraduates in the College of Liberal Arts and Sciences who elect major work in botany the following combinations of courses are suggested:—(a) General; 2a, 4a, 23, 27a, and 27b; (b) Specializing in morphology; 2a, 2b, 3a, 4a or 4b, or 24; (c) Specializing in pathology; 2a or 3a, 7a, 7b, 28a or 28b, 4a, or 17a-17b, or 21; (d) Specializing in physiology; 3a, 27a-27b, 9a or 9b; (e) Specializing in taxonomy; 2a, 4a or 4b, 16a-16b, or 17a-17b, or 26a-26b, or 28a-28b; (f) Specializing in ecology; 4a, 23, 24, 25a-25b, and 27a, or 27b.

Students taking botany as a foundation for agronomy or horticulture are advised to select courses 27a, 4a, 7a, and advanced work on some special topic or topics under courses 7b, 9, 17a-17b, or 22b. Students who expect to teach botany are advised to elect 2a, 4a, 23, 27a or 27b, and advanced work in one or more of the special courses 9a-9b, 16a-16b, 17a-17b, or 25a-25b.

The prerequisite for major work in botany in the Graduate School is 20 semester hours in botany or 15 hours in botany plus 5 hours in zoology or entomology.

Courses for Undergraduates

1. General Botany.—The structure, physiology, natural history, and uses of plants. Lectures, quiz, laboratory. *Students are advised to complete elementary chemistry before taking this course. I or II; (5).*

EITHER SEMESTER															
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor				
Botany	1	5	Lecture	—	9	—	9	—	—	228 N. H.	Trelease				
			E,Quiz	—	8	—	8	—	—						
			F,Quiz	—	—	10	—	10	—						
			G,Quiz	—	10	—	10	—	—						
			H,Quiz	—	1	—	1	—	—						
			I,Quiz	—	11	—	11	—	—						
			(Primarily for Students in Agriculture)												
			A,Laboratory	10,11	—	10,11	—	10,11	—			216 N. H.	} McDougall and Assistants		
			B,Laboratory	1,2	—	1,2	—	1,2	—			216 N. H.			
			(Primarily for Students in Liberal Arts and Sciences)												
C,Laboratory	8,9	—	8,9	—	8,9	—	216 N. H.	}							
D,Laboratory	—	10,11	—	10,11	—	10,11	216 N. H.								

2a. Morphology of Thallophytes.—Comparative laboratory study of types of the lower plants.

This and the following course are intended to give personal acquaintance with the vegetable kingdom through the study of living types selected so as to present in natural sequence the increasing complexity of structure and function which marks evolutionary development. *I; (5).*

Prerequisite: Botany 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	2a	5	Lecture	—	2	—	2	—	—	229 N. H.
			Laboratory	1,2	1	1,2	1	1,2	—	306 N. H.

2b. Morphology of Cormophytes.—Comparative laboratory study of selected types of the higher plants. *II; (5).*

Prerequisite: Botany 1.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	2b	5	Lecture	—	2	—	2	—	—	229 N. H.
			Laboratory	1,2	1	1,2	1	1,2	—	306 N. H.

3a. Plant Anatomy, Histology, and Technic.—The foundation of an exact knowledge of plant structure, especially of protoplasts and their parts and of the behavior and relations of the nucleus; the best methods of fixing, sectioning, staining, and examining tissues, modeling from serial sections, and photo-micrography. *II; (5).*

Prerequisite: Botany 1.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Botany	3a	5	Lecture	—	1	—	1	—	—	229 N. H.
			Laboratory	1,2	2	1,2	2	1,2	—	202 N. H.

4. The Local Flora.—Morphology, identification, and classification of wild plants. A laboratory and field course for students desiring personal acquaintance with the plants of Illinois, and especially for those qualifying as teachers in the public schools. *II; (3).*

Prerequisite: Entrance botany or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	4	3	—	8,9	—	8,9	—	8,9	—	306 N. H.	Hague

4a. Taxonomy of Cormophytes.—Structure, identification, and classification of higher plants. Laboratory studies chiefly of flowering plants. *II*; (5).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	4a	5	—	10,11	10,11	10,11	10,11	10,11	—	308 N. H.	Trelease

4b. Taxonomy of Algae and Bryophytes.—Structure, identification, and classification. *I*; (5).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	4b	5	—	8,9	8,9	8,9	8,9	8,9	—	306 N. H.	Hague

4d. Trees and Shrubs of the Campus.—A systematic study of the woody plants most used for decorative purposes. *I*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	4d	3	—	8,9	—	8,9	—	8,9	—	308 N. H.	Trelease

7a. Plant Pathology.—Causal agents, symptoms, diagnosis, and treatment. *I*; (5).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	7a	5	—	9	8,9	8,9	8,9	8,9	—	120 N. H.	Stevens

20. Plant Diseases.—An information course, for credit in the College of Agriculture only. More important diseases of commonly cultivated plants, diagnosis, and treatment. Lectures and laboratory. *II*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	20	3	Lecture	10	—	—	—	—	—	— N. H.	Stevens
			A, Laboratory	—	—	10,11	—	10,11	—	120 N. H.	Stevens

21. Crop Diseases.—Structure, identification, and treatment. *I*; (3).

Prerequisite: Botany 20 or 7a.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	21	3	Lecture	10	—	—	—	—	—	Botany Annex	Stevens
			Laboratory	—	—	10,11	—	10,11	—	—	—

23. Plant Ecology.—The life of plants in their natural habitats, in relation to environment, to animals, and to each other. Lectures; laboratory; field work. *I*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	23	3	Lecture	—	8	—	8	—	—	229 N. H.	McDougall
			Laboratory or Field	—	—	—	—	—	8-12	308 N. H.	McDougall

24. Taxonomy and Ecology of the Higher Fungi.—Structure, identification, classification, and ecological relations. Special attention is given to edible and poisonous mushrooms. Lectures; laboratory; field work. *II*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	24	3	Lecture	—	8	—	8	—	—	229 N. H.	McDougall
			Laboratory or Field	—	—	—	—	—	8-12	308 N. H.	McDougall

27a. Plant Physiology.—The absorption of materials from the external world and their transformation within the organism; the production and use of food. *I*; (5).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	27a	5	Lecture	—	11	—	11	—	—	229 N. H.	Hottes
			Laboratory	10,11	—	10,11	—	10,11	—	204 N. H.	Hottes

27b. Plant Physiology.—The response of the plant to external stimuli. *II*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	27b	3	Lecture	—	—	10	—	—	—	229 N. H.	Hottes
			Laboratory	10,11	—	—	—	10,11	—	204 N. H.	Hottes

Courses for Advanced Undergraduates and Graduates

Students who take courses open for credit to graduates are advised to register also for Botany 10a-10b, the weekly meeting devoted to current literature in botany, which is obligatory for candidates for an advanced degree with botany as a major subject.

Candidates for advanced degrees in botany must offer for admission to the graduate courses at least 20 hours of college work in botany.

Graduate students who elect botany for minor credit must offer the prerequisite for courses which they take for graduate credit.

7b. Methods in the Study of Fungi.—Methods of isolation, cultivation, and inoculation of fungi and bacteria. *II*; (5). *Time to be arranged.*

Professor STEVENS

Prerequisite: Ten hours of botany, including Botany 7a; junior standing.

9a-9b. Plant Anatomy or Physiology.—Problems for those specializing either in anatomy with technic, or in physiology, or in the application of these to plant breeding, crop production, and forestry. *I, II*; (3 to 5).¹

Prerequisite: 10 hours of botany, including Botany 27a or 27b; junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Botany	9a	3 to 5 ¹	Lecture	—	—	—	4	—	—	229 N. H.	Hottes
			Laboratory	{ One-half or more to be done on M. W. F. from 1 to 5; the rest arrange. }						Botany Annex	Hottes

SECOND SEMESTER											
Botany	9b	3 to 5 ¹	Schedule same as for 9a (first semester).								

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

10a-10b. Current Botanical Literature.—A weekly review covering the field of botany; supplementary to the various seminar conferences. *I, II; (1).*

Prerequisite: Concurrent taking of some course in botany open for graduate credit.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	10a 1	—	—	—	—	—	4	—	229 N. H.	Trelease Hottes Stevens Hague McDougall

SECOND SEMESTER										
Botany	10b 1	—	Schedule the same as for 1a (first semester).							

16a-16b. Taxonomy and Morphology of Algae and Bryophytes.—Advanced practise on selected groups. *I, II; (3 to 5).¹*

Prerequisite: 10 hours of botany, including 2a or 4b; junior standing. For graduate students in chemistry, 5 hours of biology and 10 hours of physical science, including manipulation of instruments, or 15 hours of physical science.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	16a 3 to 5 ¹	Laboratory					6 to 10 hrs. (Arrange)		306 N. H.	Hague

SECOND SEMESTER										
Botany	16b 3 to 5 ¹	—	Schedule the same as for 16a (first semester).							

17a-17b. Taxonomy of Cormophytes.—Advanced practise on selected taxonomic or economic groups: genera or families of Illinois plants, or plants economically important as weeds, forest resources, adjuncts to medicine, farm, orchard, or garden crops, or as the basis of floriculture, landscape architecture, street shading, or other decorative planting. *I, II; (3 to 5).¹*

Prerequisite: 10 hours of botany, including Botany 4a; junior standing.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	17a 3 to 5 ¹	Laboratory					6 to 10 hrs. (Arrange)		304 N. H.	Trelease

SECOND SEMESTER										
Botany	17b 3 to 5 ¹	—	Schedule the same as for 17a (first semester).							

22a. Morbid Histology.—The parasites of plant tissues and their histology in condition of disease. *I; (3 to 5).¹*

Prerequisite: Botany 3a and 7a or 7b; junior standing.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	22a 3 to 5 ¹	Laboratory					6 to 10 hrs. (Arrange)		Botany Annex	Stevens

22b. Groups of Fungi and Crop Diseases.—*II; (3 to 5).¹*

Prerequisite: 10 hours of botany, including 7a or 7b; junior standing.

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	22b 3 to 5 ¹	Laboratory					6 to 10 hrs. (Arrange)		Botany Annex	Stevens

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Botany

25a-25b. Plant Ecology.—Advanced studies in the ecology of plants or of plant communities. *I, II; (3 to 5).¹*

Prerequisite: Botany 23 and 27a; junior standing.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	25a 3 to 5 ¹	Laboratory							304 N. H.	McDougall

SECOND SEMESTER										
Botany	25b 3 to 5 ¹	Schedule the same as for 25a (first semester).								

[26a-26b. Taxonomy of the Higher Fungi.—Advanced practise on selected groups. *I, II; (3 to 5).¹* (Not given, 1917-18.)

Prerequisite: Botany 2a and 24; junior standing.]

28a-28b. Taxonomy of Economic Fungi.—Advanced practise on selected groups of parasitic fungi. *I, II; (3 to 5).¹*

Prerequisite: 10 hours of Botany, including Botany 7a; junior standing.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Botany	28a 3 to 5 ¹	Laboratory							Botany Annex	Stevens

SECOND SEMESTER										
Botany	28b 3 to 5 ¹	Schedule the same as for 28a (first semester).								

Courses for Graduates

101. Individual Plant Development.—The influence of external agents on the cell. Special subjects for investigation are assigned on consultation. Reports and discussions of current literature and research results. *I, II; (½ to 2 units).* *Time to be arranged.* Professor HOTTES

102. Physiology.—The effects of external stimuli on growth and movement. Special subjects for investigation are assigned on consultation. Reports and discussions of current literature and research results. *I, II; (½ to 2 units).* *Time to be arranged.* Professor HOTTES

104. Mycology.—Fungi. Individual assignments of subjects and problems in field and laboratory. *I, II; (½ to 2 units).* *Time to be arranged.* Professor STEVENS

106. Plant Pathology.—Diseases of plants, and disease agents. Special subjects are assigned upon consultation. *I, II; (½ to 2 units).* *Time to be arranged.* Professor STEVENS

108. Taxonomy.—Monographic studies of critical groups. *I, II; (½ to 2 units).* *Time to be arranged.* Professor TRELEASE

109. Ecology.—The interrelations of plants with their environment. Individual subjects for investigation. *I, II; (½ to 2 units).* *Time to be arranged.* Dr. McDUGALL

BUSINESS LAW

(See BUSINESS ORGANIZATION AND OPERATION)

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

BUSINESS ORGANIZATION AND OPERATION

(Including ACCOUNTANCY and BUSINESS LAW)

LEWIS EMANUEL YOUNG, Ph.D., *Associate Professor*ROBERT ENOCH HIERONYMUS, A.M., LL.D., *Community Adviser; lecturer on commercial and civic organizations*HIRAM THOMPSON SCOVILL, A.B., *Assistant Professor*HARRISON MCJOHNSTON, A.M., *Associate*ANANIAS CHARLES LITTLETON, A.B., *Instructor*CHARLES LE DEUC, LL.B., Ph.D., B.A.M., *Instructor*WILLIAM EVERETT BRITTON, A.M., J.D., *Instructor*LLOYD MOREY, A.B., C.P.A., *Instructor*GEORGE HILLIS NEWLOVE, A.M., *Assistant***A. ACCOUNTANCY****Courses for Undergraduates**

1a-1b. Principles of Accounting.—Principles of accounting and their application in the art of bookkeeping. Accounting procedure in double entry, illustrating the use of fundamental accounts and books. *Students who present one unit of bookkeeping for entrance will not be allowed credit for 1a and should register in the second semester in 1b.* Except in case of such students credit is not given for either 1a or 1b separately. *I, II; (3).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy 1a	3		A, Quiz	—	—	—	—	10	—	308 Com.	Newlove
			B, Quiz	—	—	—	—	1	—	308 Com.	Le Deuc
			C, Quiz	—	—	—	—	2	—	308 Com.	Le Deuc
			D, Quiz	—	—	—	—	9	—	308 Com.	Littleton
			E, Quiz	—	—	—	—	11	—	308 Com.	Newlove
			F, Quiz	—	—	—	—	3	—	308 Com.	Newlove
			G, Quiz	—	—	—	—	3	—	312 Com.	Le Deuc
			A, Practise	8,9	—	8,9	—	8,9	—	303 Com.	Newlove
			B, Practise	—	8,9	—	8,9	—	8,9	303 Com.	Le Deuc
			C, Practise	10,11	—	10,11	—	10,11	—	303 Com.	Le Deuc
			D, Practise	—	10,11	—	10,11	—	10,11	303 Com.	Littleton
			E, Practise	—	1,2,3	—	1,2,3	—	—	303 Com.	Newlove
SECOND SEMESTER											
Accountancy 1b	3		Sections and schedule same as for 1a (first semester).								

SECOND SEMESTER										
Accountancy 1a	3		Quiz	2	—	—	—	—	—	312 Com.
			Practise	—	—	1,2,3	—	1,2,3	—	303 Com.

2a-2b. Advanced Accounting and Auditing.—Theory of partnership and corporation accounts, depreciation, goodwill, reserves, and sinking funds; special financial statements, reading balance sheets, illustrative problems. Credit is not given for either semester separately. *I, II; (3).*

Prerequisite: Accountancy 1a-1b; Economics 7 or 26, 22 or 27; registration or credit in Economics 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	2a	3	A	8	—	8	—	8	—	210 Com.	Le Deuc
			B	11	—	11	—	11	—	204 Com.	Littleton
			C	1	—	1	—	1	—	111 Com.	Littleton
			D	2	—	2	—	2	—	111 Com.	Scovill
			E	2	—	2	—	2	—	210 Com.	Littleton

Business Organization and Operation

[5a-5b. C. P. A. Problems.—Representative problems of various types, including questions on theory and auditing. Credit is not given for either semester separately. *I, II; (2).* (Not given, 1917-18.)

Prerequisite: Accountancy 3a-3b.]

10. Shop Management and Shop Cost Records.—Cooperation between shop and cost departments; preparation and use of cost records; estimation of costs on contracts and calculation of profits. *II; (2).*

Prerequisite: Open only to students in engineering who have had Economics 1 or 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	10	2	—	—	10	—	10	—	—	308 Com.	Scovill

11. Farm Accounting.—The principles of accounting and distribution of costs as applied to farm operations; proper investment of funds. *I; (3).*

Prerequisite: Open only to students in agriculture who have had Economics 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	11	3	A	3	—	3	—	3	—	303 Com.	Scovill
			B	2	—	2	—	2	—	303 Com.	Newlove

Courses for Advanced Undergraduates and Graduates

3a-3b. Accounting Problems and Auditing.—Consolidated balance sheets; liquidation; the auditor's duties; schedules and reports. Credit is not given for either semester separately. *I, II; (3).*

Pre requisite: Accountancy 2a-2b; Economics 3; credit or registration in Business Organization and Operation 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	3a	3	—	—	1	1	1	—	—	312 Com.	Scovill

SECOND SEMESTER				
Accountancy	3b	3	—	Schedule the same as for 3a (first semester).

4a-4b. Cost Accounting.—(a) Cost accounting applied to factory procedure, overhead expense, the installation and control of cost systems, presentation of cost data; (b) as a basis for manufacturing efficiency; (c) the construction of cost systems. *I, II; (2).*

Prerequisite: Accountancy 2a-2b, Economics 1. For the current year, open also to seniors who have had Accountancy 1a-1b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Accountancy	4a	2	—	—	8	—	8	—	—	202 Com.	Scovill

SECOND SEMESTER				
Accountancy	4b	2	—	Schedule same as for 4a (first semester).

13a-13b. Public Accounting and Business Procedure.—Accounts and systems of institutions and municipalities, and of the State and Federal governments. Functional organization; procedure; budget, accounts and records, reports, audits; purchasing and storekeeping. As given in 1917-18 special attention will be paid to training for Federal service. *I, II; (2).*

Prerequisite: Accountancy 2a-2b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Accountancy	13a	2	—	—	2	—	2	—	—	307 Com.	Morey

SECOND SEMESTER											
Accountancy	13b	2	Sections and schedule the same as for 13a (first semester).								

B. BUSINESS ORGANIZATION AND OPERATION

Courses for Undergraduates

1. Business Organization and Operation.—Individual proprietorship, partnership, and cooperation; the process of organizing a business; organization for operation and the reaction of form of organization on efficiency; gradation and interrelation of divisions and departments; departmental responsibility and authority, routine, and discipline. *I*; (3).

Prerequisite: Economics 1 and Accountancy 2a-2b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Business Organization and Operation	1	3	A Lecture	—	—	11	—	—	—	100 Com.	Young
			B Lecture	—	—	2	—	—	—	100 Com.	
			A ₁ Quiz	11	—	—	—	11	—	312 Com.	
			A ₂ Quiz	—	11	—	11	—	—	312 Com.	
			B ₁ Quiz	2	—	—	—	2	—	312 Com.	
			B ₂ Quiz	—	2	—	2	—	—	312 Com.	

2. Organization and Control of Mercantile Distribution.—Problems of organization and management of wholesale and retail establishments. Supervision and control of mercantile distribution by business associations, by consumers, and by political units. *II*; (2).

Prerequisite: Business Organization and Operation 1; Economics 28.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Business Organization and Operation	2	2	A	—	11	—	11	—	—	312 Com.	Young
			B	—	2	—	2	—	—	312 Com.	Young

[3. Business Procedure.—Conventional business practises; cash and trade discounts; commissions; interest and discounts; forms and uses of checks, notes, drafts, and other instruments of credit and exchange; the rules and procedure of banking institutions; mercantile and credit agencies. Office organization and management. *I*; (2). (Not given, 1917-18.)

Prerequisite: Business Organization and Operation 2.]

7. Salesmanship.—Policies and practise of modern sales organizations; selling problems of manufacturers, wholesalers, and retailers, management of salesmen; the practise of individual salesmen. *I*; (2).

Prerequisite: Economics 1; Business Organization and Operation 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Business Organization and Operation	7	2	—	8	—	8	—	—	—	312 Com.	McJohnston

8. Advertising.—Principles and current practise; cooperation of advertising and persona selling; special problems; planning sales campaigns; choice of media; space buying; and practise in writing copy. *II*; (2).

Prerequisite: Business Organization and Operation 7.

Business Organization and Operation

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	8	2	—	8	—	8	—	—	—	308 Com.	McJohnston

9. Commercial and Civic Organizations.—For students preparing for positions as secretaries of commercial or agricultural associations, civic or welfare clubs, and similar organizations. *II*; (1).

Prerequisite: Economics 1, Business Organization and Operation 2 or Economics 28; or Economics 2 and Farm Management 1; or Economics 1, Political Science 4, and Sociology 8.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	9	1	—	11	—	—	—	—	—	206 Com.	Hieronymus

10. Organization and Operation of Newspaper Publishing.—Designed primarily for students specializing in journalism. Growth of the industry in the United States; number, kinds, and distribution of newspapers; national organization of the industry; buying and selling practises; methods of securing and handling advertising; systems of gaining and holding circulation; cost accounting and office systems; shop management and labor problems. *II*; (2).

Prerequisite: Economics 1 or 2; junior standing. Not given, 1917-18.

Course for Advanced Undergraduates and Graduates

4. Industrial Organization and Management.—Problems of organization and of administrative policy; supervision and management of industries and industrial units. Relations to labor, the community, and law. *II*; (2).

Prerequisite: Business Organization and Operation 2. Senior engineering students who have had Economics 1 or 2 may be admitted by permission of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Organization and Operation	4	2	—	—	10	—	10	—	—	312 Com.	Young

Courses for Graduates

[101. Regulation and Control of Mercantile Distribution.—Federal, state, and local regulation of mercantile business; unfair competition; trade agreements; trade mark; inspection of mercantile establishments; pure food acts; control over weights and measures, packing, storage, and shipment. *Twice a week; I, II; (1 unit).* (Not given, 1917-18.)]

102. Scientific Management.—The history of the scientific management movement; critical study of the proposed systems; results of the application of scientific principles in the management of various types of business enterprise. *Twice a week; I, II; (1 unit).* Time to be arranged. Assistant Professor YOUNG

C. BUSINESS LAW

Courses for Undergraduates

1a-1b. Commercial Law.—Principles underlying the law of contracts, negotiable instruments, agency, partnerships, business corporations, sales of personal property, bailments and carriers, guaranty and suretyship, and insurance. *I*, *II*; (3).

Prerequisite: Sixty hours of university credit, including Economics 1 and Accountancy 1a-1b.

FIRST SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Law 1a	3	A	8	—	8	—	8	—	307 Com.	Britton
		B	2	—	2	—	2	—	307 Com.	Britton
		C	3	—	3	—	3	—	307 Com.	Britton

SECOND SEMESTER

Business Law 1b 3 Schedule and sections the same as for 1a (first semester).

2. Elementary Law.—Contracts; leases; landed property. Open to junior and senior students in agriculture only. *II*; (3).

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Law 2	3	—	1	—	1	—	1	—	307 Com.	Britton

3. Business Law.—The law of contracts, negotiable instruments, agency, partnerships, corporations, sales of personal property, bailments and carriers, guaranty and suretyship, insurance, real property, and landlord and tenant. Open to junior and senior students in engineering only. *II*; (3).

Prerequisite: Economics 1 or 2.

SECOND SEMESTER

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Business Law 3	3	—	10	—	10	—	10	—	312 Com.	Young

CELTIC

(See ENGLISH)

CERAMIC ENGINEERING

EDWARD WIGHT WASHBURN, Ph.D., *Professor, Ceramic Chemistry*

CULLEN WARNER PARMELEE, B.S., *Professor*

RALPH KENT HURSH, B.S., *Assistant Professor*

HOWARD C ARNOLD, A.M., *Instructor*

EARL E LIDMAN, B.S., *Assistant*

The courses offered by the department of ceramic engineering are designed to give a technical knowledge of the composition and properties of materials used in the manufacture of claywares, cements, glasses, and enamels, and to acquaint the student with the construction, equipment, and operation of ceramic plants.

Graduates of courses other than ceramic engineering who have the necessary prerequisites may take the following courses for minor credit: 3, 5, 6, 8, 10, 13, 14, 15, and 16.

Ceramic Engineering

Courses for Undergraduates

1. Ceramic Materials.—The properties of clays and other ceramic materials; the identification of the varieties met in practical work. Lectures; laboratory. *I*; (3).

Prerequisite: Chemistry 4.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	1	3	—	—	1-4	—	1-4	—	9-12	113 Cer. 218 Cer.
										Instructor Parmelee Arnold

2. Winning and Preparation of Clays.—Machinery and processes used in preparing clays for market or manufacture; comparative costs of the different methods. *I*; (3).

Prerequisite: Registration in Ceramic Engineering 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	2	3	—	8	—	8	—	8	—	218 Cer.
										Instructor Arnold

3. Industrial Calculations.—Chemical and physical calculations applying to the operation of furnaces, kilns, and dryers; temperature measurements; *II*; (3).

Prerequisite: Ceramic Engineering 1, 2; Physics 1a-1b and 3a-3b.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	3	3	—	10	—	10	—	10	—	214 Cer.
										Instructor Hursh

4. Drying and Burning.—The chemical and physical processes involved and the types of equipment used in drying and burning clayware. *I*; (4).

Prerequisite: Ceramic Engineering 1, 2, 3.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	4	4	—	9	9	9	9	—	—	218 Cer.
										Instructor Hursh

5. Ceramic Bodies.—Composition and properties of ceramic body mixtures; effects of various ingredients; development of special bodies. Lectures; laboratory. *II*; (5).

Prerequisite: Ceramic Engineering 1, 2.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	5	5	Lecture	9	—	9	—	9	—	214, 218 Cer.
			Laboratory	1-4	—	1-4	—	—	—	103, 113 Cer.
										Instructor Parmelee Arnold

6. Glazes.—The various classes of glazes and enamels; the composition, limits, properties, and defects. Lectures; laboratory. *I*; (6).

Prerequisite: Ceramic Engineering 3, 5.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Cer. E.	6	6	Lecture	—	10	—	10	9	—	214, 218 Cer.
			Laboratory	1-4	—	1-4	—	1-4	—	114 Cer.
										Instructor Parmelee Arnold

8. Glass.—Raw materials, preparation, compounding, melting, and shaping; chemical principles involved in the manufacture and decoration of the various types of vitreous silicates. Lectures. *II*; (2).

Prerequisite: Ceramic Engineering 6.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Cer. E.	8	2	—	—	11	—	11	—	—	214, 218 Cer.	Arnold Parmelee

9. Ceramic Construction.—Plans, specifications, and estimates for ceramic equipments and industrial plants. *II*; (4).

Prerequisite: General Engineering Drawing 2; Ceramic Engineering 3, 4.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Cer. E.	9	4	—	1-4	1-4	1-4	1-4	—	—	212, 218 Cer.	Hursh

10. Cements.—Cements, limes, plasters; composition; reactions; methods of manufacture and testing. *I*; (3).

Prerequisite: Ceramic Engineering 1, 2, 3.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Cer. E.	10	3	—	(Arrange)						—	Hursh

11. Thesis.—*II*; (3 to 5)¹.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Cer. E.	11	3 to 5 ¹	—	(Arrange)						102 Cer.	Washburn Parmelee Hursh

12. Designing and Shaping.—Die construction; templates; master and working molds for pressing, casting, and jiggering. *II*; (3).

Prerequisite: Ceramic Engineering 1, 2.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Cer. E.	12	3	—	—	—	—	10	1-4	8-11	Cer.	Arnold

13. Cement Laboratory.—The preparation of silicate cements and the study of their properties. *II*; (3).

Prerequisite: Ceramic Engineering 10.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Cer. E.	13	3	—	(Arrange)						102 Cer.	Hursh

15. Glass Laboratory.—Soda-lime, potash-lime, lead, barium, and zinc silicates; boro-silicates; properties of fused and solidified glasses; practical glass problems. *II*; (3).

Prerequisites: Ceramic Engineering 6. Registration in Ceramics 8.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Cer. E.	15	3	—	(Arrange)						114 Cer.	Arnold

16. Enamels.—The various types of enamels, their composition, application, properties and testing. Lectures; laboratory. *II*; (3).

Prerequisite: Ceramic Engineering 6.

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Ceramic Engineering

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Cer. E.	16	3	(Arrange)						114 Cer.	Parmelee

17. The Principles of Physical Chemistry with Special Reference to their Applications to Ceramic Materials and Processes.—Lectures and discussions. Assigned reading. *I*; (3).

Prerequisite: Ceramic Engineering 1, 3; calculus.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Cer. E.	17	3	11	11	11	11	—	—	214 Cer.	Washburn

18. Ceramic Microscopy.—The use of the microscope in the examination of ceramic materials and products. Laboratory and conferences. *I*; (3).

Prerequisite: Ceramic Engineering 5. Elementary mineralogy.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Cer. E.	18	3	(Arrange)						Cer.	Arnold

19. Special Bodies.—An intensive study of body preparation: the composition, preparation, properties, uses and testing of selected types of bodies. Lectures; laboratory. *II*; (3).

Prerequisite: Ceramic Engineering 5.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Cer. E.	19	3	(Arrange)						103, 113 Cer.	Parmelee

20. Refractory Materials.—Properties and uses of refractory materials employed in the industries; relation between refractory power, chemical composition and physical condition; changes undergone by refractory materials at high temperatures. The subject will be presented as far as possible from the standpoint of the Phase Rule. Lectures and discussions. Assigned reading. *II*; (2).

Prerequisite: Ceramic Engineering 17 or Chemistry 31.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Cer. E.	20	2	(Arrange)						Cer.	Washburn

99. Inspection Trip.—Visits to industrial plants representative of various phases of ceramic work. *I*; (no credit). *Time to be arranged.*

Prerequisite: Senior standing.

Courses for Graduates

Graduate work leading to the degrees of Master of Science and Doctor of Philosophy in either chemistry (ceramic chemistry) or engineering (ceramic engineering) is offered by the department. Students who have specialized in chemistry, chemical engineering, or ceramic engineering during their undergraduate work will ordinarily be qualified to enter on graduate work leading to higher degrees in ceramic chemistry, while students who have specialized in mechanical engineering, ceramic engineering, or chemical engineering in their undergraduate work will ordinarily be qualified to pursue graduate work leading to the higher degrees in ceramic engineering. Graduate students who wish to elect ceramic chemistry as their major field of study must have had the equivalent of twenty-five semester hours in chemistry and this must include satisfactory courses in gen-

eral chemistry, qualitative and quantitative analysis, and either physical or organic chemistry. Such students must also have had at least one year of college physics and a training in mathematics which includes calculus.

Candidates for the degree of Doctor of Philosophy with their major field of study in ceramic chemistry must fulfill the same general requirements in chemistry as candidates in other branches of chemistry. They will also be expected to offer physical chemistry as one of their minor subjects. Before receiving the degree of Doctor of Philosophy, all such candidates must demonstrate their ability to read French and German literature in their major subject.

101. The Chemistry of the Compounds of Silicon.—Lecture and seminar. *Twice a week. I, II; ($\frac{3}{4}$ unit).* Professor WASHBURN

Prerequisite: Elementary courses in organic and physical chemistry.

103. Silicon Chemistry.—A laboratory course to supplement Ceramic Engineering 101, which must precede or accompany it. *II; (1 to 2 units).*

Professor WASHBURN

102. General Technology of the Clay Industries.—An advanced course dealing with the physical properties of ceramic materials and products in the light of their dependence upon chemical composition, mineralogical constitution, and physical condition. Lectures, seminar, and laboratory. *I, II; (1 to 2 units).*

Professor PARMELEE

Prerequisite: The elements of mineralogy and of physical chemistry.

105. Technology of Glass.—Glassy silicates; limiting compositions; physical and chemical properties of glasses and the dependence of these properties upon composition. Lectures and laboratory. *(1 to 2 units).*

Professor PARMELEE

CHEMISTRY

WILLIAM ALBERT NOYES, Ph.D., LL.D., *Professor and Director*

SAMUEL WILSON PARR, M.S., *Professor*

HARRY SANDS GRINDLEY, D.Sc., *Professor*

EDWARD BARTOW, Ph.D., *Professor*

RICHARD CHACE TOLMAN, Ph.D., *Professor*

DAVID FORD MCFARLAND, Ph.D., *Associate Professor*

GEORGE MCPHAIL SMITH, Ph.D., *Assistant Professor*

ROGER ADAMS, Ph.D., *Assistant Professor*

B SMITH HOPKINS, Ph.D., *Assistant Professor*

HOWARD BISHOP LEWIS, Ph.D., *Assistant Professor*

GEORGE DENTON BEAL, Ph.D., *Associate*

HORACE GROVE DEMING, Ph.D., *Associate*

OLIVER KAMM, Ph.D., *Associate*

JESSIE YEREANCE CANN, Ph.D., *Associate*

GEORGE WALLACE SEARS, Ph.D., *Instructor*

GERARD VAN ROSSEN, Ph.D., *Instructor*

FREDERICK OSBAND ANDEREGG, Ph.D., *Instructor*

HERBERT E EASTLACK, Ph.D., *Instructor*

HARRY CLEVELAND KREMERS, Ph.D., *Instructor*

SILAS ALONZO BRALEY, Ph.D., *Instructor*

WALTER E THRUN, Ph.D., *Instructor*

CARL J ENGELDER, Ph.D., *Instructor*

SCOTT CHAMPLIN TAYLOR, M.S., *Assistant*

Chemistry

LLOYD BRELSFORD HOWELL, A.B., *Assistant*
JAY THOMAS FORD, M.S., *Assistant*
FLOYD ELBA ROWLAND, A.M., *Assistant*
WILLIAM ALEXANDER VANWINKLE, B.S., *Assistant*
JOHN FREDERICK GROSS HICKS, M.S., *Assistant*
HARRY JAMES BEATTIE, A.M., *Assistant*
RALPH EMERSON RINDFUSZ, A.M., *Assistant*
ALFRED RICHARD POWELL, A.M., *Assistant*
LANSING SADLER WELLS, A.M., *Assistant*
LEONARD FRANCIS YNTEMA, A.M., *Assistant*
MINER MANLEY AUSTIN, A.B., *Assistant*
JOHN BERNIS BROWN, M.S., *Assistant*
RALPH WILLIAM HUFFERD, A.M., *Assistant*
RUSSELL STARKEY BRACEWELL, A.B., *Assistant*
WILLIAM LIONEL MCCLURE, A.B., *Assistant*
HERBERT EPHRAIM FRENCH, A.M., *Assistant*
CARL SHIPP MARVEL, A.M., *Assistant*
ARTHUR NORTON BENNETT, M.S., *Assistant*
EDMAN GREENFIELD, A.M., *Assistant*
GEORGE LEWIS SCHWARTZ, B.S., *Assistant*
RUTH EVELYN MERLING, M.S., *Assistant*
ARTHUR BLAINE HAW, B.S., *Research Assistant*
JOSEPH MARVIN BRAHAM, M.S., *Research Assistant*
ALLEN EDWIN STEARN, A.M., *Research Assistant*
PAUL ANDERS, *Assistant, Glass Blowing*
SARGENT GASTMAN POWELL, M.S., *Graduate Assistant*
LYNNE HERMAN ULICH, B.S., *Graduate Assistant*
ISAAC HAHN GODLOVE, A.M., *Graduate Assistant*
OTIS AVERY BARNES, B.S., *Graduate Assistant*
LLOYD HILTON REYERSON, A.M., *Graduate Assistant*
RUSSELL WARD MILLER, B.S., *Graduate Assistant*
RALPH HIPPLE DEAN, A.M., *Graduate Assistant*
CLARENCE EDGAR SIMS, M.S., *Graduate Assistant*
ARTHUR EDWARD BROOKS, A.B., *Graduate Assistant*
ROSSLENE MERLE ARNOLD, A.B., *Graduate Assistant*
ADAM A CHRISTMAN, B.S., *Graduate Assistant*
IVAR NIMES HULTMAN, B.S., *Graduate Assistant*
HUBERT WATSON MOOR, B.S., *Graduate Assistant*

Cooperating:

EDWARD WIGHT WASHBURN, Ph.D., *Professor, Ceramic Chemistry*
FRED WEAVER MUNCIE, Ph.D., *Associate, Floricultural Chemistry*

Major: 20 hours, exclusive of Chemistry 1, 1a, 1b, 4, and 16, and inclusive of courses in quantitative analysis and organic chemistry.

Minors: 20 hours, chosen from bacteriology, botany, geology, mathematics, philosophy, physiology, physics, and zoology.

Students taking chemistry at the University are advised to give at least one year to the subject, and this should include Chemistry 1 or 1a, 2a or 3a. Those continuing in the second year should take Chemistry 5a and 5b, or 13a and 25. In the third year Chemistry 14a, 14b, or 9, 9a, and 9b, or 9c, 31, and 33 should be

taken. With these, more special courses may be taken if desired, but students are not advised to take the special courses unless they have had the fundamental work represented by the selection given above. Students who desire a training for professional work in chemistry, either as teachers or in its industrial applications, should take the curriculum in chemistry, or in chemical engineering.

Students who find it impossible to take more than one semester's work are requested to register for Chemistry 1 or 1a in the second semester rather than in the first.

1. Inorganic Chemistry.—The non-metallic elements. Noyes: *Textbook of Chemistry. I or II*; (5).

NOTE.—Students who have received entrance credit for high school chemistry are given only 3 hours credit for Chemistry 1.

FIRST SEMESTER													
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor		
Chemistry	1	5	A,Lecture	—	11	—	11	—	—	100 Ch.	Noyes		
			B,Lecture	—	9	—	9	—	—	100 Ch.	Deming		
			A,Quiz	8	—	8	—	—	—	103 Ch.	Hopkins Deming Sears Cann		
			B,Quiz	11	—	11	—	—	—	103 Ch.			
			C,Quiz	—	8	—	8	—	—	103 Ch.			
			D,Quiz	—	10	—	10	—	—	103 Ch.			
			E,Quiz	—	1	—	1	—	—	103 Ch.			
			A,Laboratory	8,9	—	8,9	—	8,9	—	350 Ch.	Anderegg		
			B,Laboratory	10,11	—	10,11	—	10,11	—	350 Ch.	Kremers		
			C,Laboratory	—	8,9	—	8,9	—	8,9	350 Ch.	and		
			D,Laboratory	1,2	—	1,2	—	1,2	—	350 Ch.	Assistants		
			SECOND SEMESTER										
					Lecture	—	11	—	11	—	—	100 Ch.	Deming
		A,Quiz	11	—	11	—	—	—	116 Ch.	Hopkins			
		B,Quiz	—	8	—	8	—	—	116 Ch.	Deming			
		C,Quiz	—	10	—	10	—	—	116 Ch.	Sears			
		A,Laboratory	8,9	—	8,9	—	8,9	—	308 Ch.	Cann			
		B,Laboratory	10,11	—	10,11	—	10,11	—	308 Ch.	Anderegg			
		C,Laboratory	—	1,2,3	—	1,2,3	—	—	308 Ch.	Kremers			
										and			
										Assistants			

1a. Inorganic Chemistry.—Lectures; recitations; laboratory. For students who have had one year of high school chemistry. *I or II*; (3).

Prerequisite: One year of entrance chemistry.

NOTE.—Students whose preparation proves to be inadequate for continuing this course will be required to change their registration to Chemistry 1. Students who have not used their high school chemistry for entrance may upon petition, receive 5 hours credit for Chemistry 1a. Students who have failed in Chemistry 1 are permitted to register for Chemistry 1a and will receive 5 hours credit, on petition, if their final grade is 85 or above.

¹Students following the curriculums in chemistry and chemical engineering must enroll in this section.

Chemistry

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	1a	3	C,Lecture	—	—	—	10	—	—	100 Ch.	Hopkins
			D,Lecture	—	—	—	2	—	—	100 Ch.	
			F,Quiz	9	—	9	—	—	—	116 Ch.	
			G,Quiz	11	—	11	—	—	—	116 Ch.	Hopkins Deming Sears Cann Anderegg Kremers and Assistants
			H,Quiz	—	8	—	8	—	—	111 Ch.	
			I,Quiz	—	9	—	9	—	—	111 Ch.	
			J,Quiz	—	1	—	1	—	—	116 Ch.	
			K,Quiz	—	—	8	—	8	—	116 Ch.	
			L,Quiz	—	—	1	—	1	—	116 Ch.	
			E,Laboratory	8,9	—	—	—	—	—	308 Ch.	
			F,Laboratory	—	10,11	—	—	—	—	308 Ch.	
			G,Laboratory	—	—	—	8,9	—	—	450 Ch.	
			H,Laboratory	—	—	—	10,11	—	—	450 Ch.	
			I,Laboratory	—	—	—	—	8,9	—	308 Ch.	
			J,Laboratory	—	—	—	—	—	8,9	308 Ch.	
			K,Laboratory	1,2	—	—	—	—	—	308 Ch.	
			L,Laboratory	—	1,2	—	—	—	—	308 Ch.	
			M,Laboratory	—	3,4	—	—	—	—	308 Ch.	
			N,Laboratory	—	—	1,2	—	—	—	308 Ch.	
			O,Laboratory	—	—	—	1,2	—	—	308 Ch.	
			P,Laboratory	—	—	—	—	1,2	—	467 Ch.	
SECOND SEMESTER											
			Lecture	—	—	11	—	—	—	100 Ch.	Cann Cann Sears Anderegg Kremers and Assistants
			D,Quiz	10	—	10	—	—	—	103 Ch.	
			E,Quiz	—	10	—	10	—	—	103 Ch.	
			F,Quiz	—	11	—	11	—	—	103 Ch.	
			E,Laboratory	—	8,9	—	—	—	—	308 Ch.	
			F,Laboratory	—	—	—	—	—	8,9	308 Ch.	
			G,Laboratory	1,2	—	—	—	—	—	308 Ch.	
			H,Laboratory	—	—	—	1,2	—	—	308 Ch.	

1b. Inorganic Chemistry.—Lectures; recitations; laboratory. (For students in engineering.) *I* or *II*; (4).

NOTE.—Students who have credit for high school chemistry should register for Chemistry 1a.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	1b	4	A,Lecture	—	11	—	11	—	—	100 Ch.	Noyes
			B,Lecture	—	9	—	9	—	—	100 Ch.	Deming
			M,Quiz	11	—	11	—	—	—	201 Ch.	Deming
			N,Quiz	—	—	8	—	8	—	303 Ch.	
			O,Quiz	—	—	1	—	1	—	201 Ch.	
			Q,Laboratory	—	8,9	—	8,9	—	—	467 Ch.	Anderegg
			R,Laboratory	—	1,2	—	1,2	—	—	467 Ch.	Kemers
			S,Laboratory	8,9	—	—	—	8,9	—	467 Ch.	and
			T,Laboratory	—	—	1,2	—	1,2	—	467 Ch.	Assistants
SECOND SEMESTER											
			Lecture	—	11	—	11	—	—	100 Ch.	Deming
			G,Quiz	11	—	11	—	—	—	111 Ch.	Deming
			I,Laboratory	—	—	—	1,2	—	8,9	308 Ch.	and
											Assistants

2a. Inorganic Chemistry and Qualitative Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Lectures; recitations; laboratory. *I* or *II*; (5).

Prerequisite: Chemistry 1 or 1a.

¹Students following the curriculums in chemistry and chemical engineering must enroll in this section.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	2a	5	Lecture	—	—	9	—	9	—	100 Ch.	Cann
			A, Quiz	—	—	9	—	—	—	201 Ch.	Cann Sears Anderegg Kremers
			B, Quiz	—	11	—	11	—	—	201 Ch.	
			C, Quiz	—	—	8	—	8	—	204 Ch.	
			A, Laboratory	—	8,9	—	8,9	—	8,9	305 Ch.	
			B, Laboratory	10,11	—	10,11	—	10,11	—	305 Ch.	
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			A, Lecture	—	9	—	9	—	—	100 Ch.	Noyes
			B, Lecture	—	10	—	10	—	—	100 Ch.	Hopkins
			A, Quiz	8	—	8	—	—	—	201 Ch.	Hopkins Sears Cann Anderegg Kremers and Assistants
			B, Quiz	10	—	10	—	—	—	201 Ch.	
			C, Quiz	11	—	11	—	—	—	201 Ch.	
			D, Quiz	—	8	—	8	—	—	201 Ch.	
			E, Quiz	—	10	—	10	—	—	201 Ch.	
			F, Quiz	—	11	—	11	—	—	201 Ch.	Hopkins Sears Cann Anderegg Kremers and Assistants
			G, Quiz	—	1	—	1	—	—	201 Ch.	
			H, Quiz	—	2	—	2	—	—	201 Ch.	
			I, Quiz	—	—	9	—	9	—	204 Ch.	
			J, Quiz	—	—	1	—	1	—	201 Ch.	
			A, Laboratory	8,9	—	8,9	—	8,9	—	350 Ch.	Hopkins Sears Cann Anderegg Kremers and Assistants
			B, Laboratory	—	8,9	—	8,9	—	8,9	305 Ch.	
			C, Laboratory	10,11	—	10,11	—	10,11	—	305 Ch.	
			D, Laboratory	1,2	—	1,2	—	1,2	—	305 Ch.	
			E, Laboratory	—	1,2	—	1,2	—	9,10	350 Ch.	

3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. *II*; (6).

Prerequisite: Chemistry 1 or 1a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	3a	6	Lecture	—	10	—	10	—	—	100 Ch.	Hopkins
			Quiz	10	—	10	—	—	—	303 Ch.	Sears
			Laboratory	1,4	—	1,4	—	1,4	—	350 Ch.	Kremers

4. Qualitative Analysis and Chemistry of the Metallic Elements.—Lecture, class, and laboratory work. (For students in engineering.) *I* or *II*; (4).

Prerequisite: Chemistry 1a or 1b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	4	4	Lecture	—	—	11	—	—	—	100 Ch.	Hopkins
			A, Quiz	3	—	3	—	—	—	116 Ch.	Hopkins Sears Anderegg Kremers and Assistants
			B, Quiz	—	8	—	8	—	—	116 Ch.	
			C, Quiz	—	11	—	11	—	—	116 Ch.	
			A, Laboratory	—	1-4	—	1-4	—	—	305 Ch.	
			B, Laboratory	—	—	1-4	—	1-4	—	305 Ch.	
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			Lecture	—	—	—	—	11	—	100 Ch.	Hopkins
			A, Quiz	8	—	8	—	—	—	103 Ch.	Hopkins Sears Anderegg Kremers and Assistants
			B, Quiz	9	—	9	—	—	—	103 Ch.	
			C, Quiz	11	—	11	—	—	—	103 Ch.	
			D, Quiz	2	—	2	—	—	—	103 Ch.	
			E, Quiz	—	9	—	9	—	—	103 Ch.	
			F, Quiz	—	10	—	10	—	—	204 Ch.	Hopkins Sears Anderegg Kremers and Assistants
			G, Quiz	—	11	—	11	—	—	116 Ch.	
			H, Quiz	—	2	—	2	—	—	116 Ch.	
			A, Laboratory	8,9	—	8,9	—	8,9	—	467 Ch.	
			B, Laboratory	—	8,9	—	8,9	—	8,9	467 Ch.	
			C, Laboratory	1-4	—	—	—	1-4	—	467 Ch.	Hopkins Sears Anderegg Kremers and Assistants
			D, Laboratory	—	8-11	—	8-11	—	—	467 Ch.	
			E, Laboratory	—	1-4	—	1-4	—	—	467 Ch.	

Chemistry

5a. Elementary Quantitative Analysis.—Gravimetric and volumetric analysis; stoichiometrical relations and the application of the fundamental laws of chemistry to quantitative analysis. Lectures; recitations; laboratory. Talbot: *Quantitative Chemical Analysis*. I or II; (5). Assistant Professor SMITH in charge

Prerequisite: Chemistry 2a, or 3a, or 4.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	5a	5	Lecture or								
			Quiz	9	—	9	—	—	—	100 Ch.	Smith
			A,Laboratory	—	1-4	—	1-4	—	8-12	218 Ch.	Smith
			B,Laboratory	1-4	—	1-4	—	1-4	—	260 Ch.	Smith
SECOND SEMESTER											
			Lecture	—	9	—	9	—	—	217 Ch.	Eastlack
			Laboratory	—	1-4	—	1-4	—	8-12	216 Ch.	Eastlack

5b. Quantitative Analysis.—(Continuation of Chemistry 5a.) Analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; recitations; laboratory. Treadwell-Hall: *Analytical Chemistry*, Vol. II. II; (5).

Prerequisite: Chemistry 5a.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Chemistry	5b	5	Lecture	—	9	—	9	—	—	217 Ch.
			Laboratory	—	1-4	—	1-4	—	8-12	260 Ch.

NOTE.—For Chemistry 5c, see Chemistry 25.

6.¹ Chemical Technology.—Technological chemistry as illustrated in those industries having a chemical basis for their principal operations and processes; trade journals. Lectures; recitations. Rogers and Aubert: *Industrial Chemistry*. II; (3).

Prerequisite: Chemistry 5a and 14a.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Chemistry	6	3	—	11	—	11	—	11	—	161 Ch.

7.¹ Metallurgy.—General metallurgy; metallurgy of iron and steel. Lectures; assigned reading; recitations. Fulton: *Principles of Metallurgy*; Stoughton: *Iron and Steel*. I; (3).

Prerequisite: Chemistry 5a. (Senior students in engineering courses may be admitted to this course by special arrangement, without this prerequisite.)

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Chemistry	7	3	A	11	—	11	—	11	—	161 Ch.
			B ²	8	—	8	—	8	—	161 Ch.

7a. Metallurgy of the Non-Ferrous Metals.—Copper, lead, zinc, gold, and silver. II; (3).

Prerequisite: Chemistry 7.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Chemistry	7a	3	—	—	8	—	8	—	8	161 Ch.

¹Certain required inspection trips will be arranged in connection with courses 6 and 7. Students registered in these courses should take into consideration the expense involved, which will approximate \$15.00 for each course.

²For senior students in engineering only.

9. Elementary Organic Chemistry.—A study of the more important compounds of carbon from a theoretical and practical standpoint. *II*; (3).

Prerequisite: Chemistry 2a or 3a.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	9	3	—	8	—	8	—	8	—	100 Ch. Adams

9c. Elementary Organic Chemistry (Laboratory work).—To accompany Chemistry 9. *II*; (2).

Prerequisite: Chemistry 2a or 3a; registration in Chemistry 9, or equivalent.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	9c	2	—	1-4	—	1-4	—	—	250 Ch.	Adams

10a. Water Chemistry.—History, sources, contamination, and standards of purity of potable waters and waters for industrial purposes. Lectures; practise in analytical methods. *II*; (3).

Prerequisite: Chemistry 5a or 13a.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	10a	3	—	1-4	—	1-4	—	8,11	60-B Ch.	Bartow Bennett Greenfield

10b. Chemistry of Water and Sewage.—The chemical analysis of potable waters and waters for industrial purposes. Lectures on the history, sources, contamination, and standards of purity. Chemical analysis of sewage and effluents from sewage treatment plants, for students in sanitary engineering, registered in connection with Civil Engineering 53. *I*; (2½).

Prerequisite: Chemistry 4.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	10b	2½	—	9-12	—	9-11	—	9-12	9-11	60-B Ch. Bartow Bennett Greenfield

11a-11b. Thesis.—Thesis, embodying a review of the literature of the subject; account of work done in the laboratory. The subject should be determined upon and reading begun in the junior year. A minimum of five semester hours is required. (Required of seniors in chemistry and chemical engineering.) *I, II*; (3 to 5)¹.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	11a	3 to 5 ¹	—	—	—	—	—	—	—	Noyes in charge
Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	11b	3 to 5 ¹	—	—	—	—	—	—	—	Noyes in charge

13a. Elementary Quantitative Analysis.—Gravimetric and volumetric analysis, fertilizer and milk analysis. Lectures; recitations; laboratory. Talbot: *Quantitative Chemical Analysis*. (For students in agriculture.) *I* or *II*; (5).

Assistant Professor SMITH in charge

Prerequisite: Chemistry 2a, or 3a.

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Chemistry

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Chemistry	13a	5	Lecture	—	—	11	—	—	—	100 Ch.	Beal Beal Eastlack
			A, Lab. & Quiz	8-11	—	8-11	—	8-11	—	218 Ch.	
			B, Lab. & Quiz	—	8-12	—	8-12	—	8	218 Ch.	
			C, Lab. & Quiz	—	1-4	—	1-4	—	8-11	260 Ch.	
SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
			Lecture	11	—	—	—	—	—	100 Ch.	Eastlack Beal Eastlack
			A, Lab. & Quiz	8-11	—	8-11	—	8-11	—	218 Ch.	
			B, Lab. & Quiz	—	8-12	—	8-12	—	8	260 Ch.	
			C, Lab. & Quiz	1-4	—	1-4	—	1-4	—	260 Ch.	

13b. Advanced Agricultural Analysis.—Special methods in agricultural analysis; theory of the determinations; preparation of solutions; sampling; calculations. Treadwell: *Analytical Chemistry*, Vol. II. *II*; (5).

Prerequisite: Chemistry 5a or 13a.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Chemistry	13b	5	Lecture	1	—	1	—	—	—	161 Ch.	Beal
			Laboratory	2,3	—	2,3	—	1-4	—	216 Ch.	Beal

14a-14b. Organic Chemistry.—Lectures; recitations. Noyes: *Organic Chemistry*. *I*; (4); *II*; (2).

Prerequisite: Chemistry 5a; should be accompanied by Chemistry 14c and 14d.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Chemistry	14a	4	—	9	9	9	9	—	—	217 Ch.	Noyes
SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Chemistry	14b	2	—	9	—	9	—	—	—	217 Ch.	Noyes

14c. Organic Chemistry (Laboratory work).—Organic synthesis. (Formerly Chemistry 9a.) *I* or *II*; (2).

Prerequisite: Registration in Chemistry 14a, or equivalent.

FIRST SEMESTER											Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S			
Chemistry	14c	2	A	1-4	—	1-4	—	—	—	250 Ch.	}	Kamm
			B	—	1-4	—	1-4	—	—	250 Ch.		
SECOND SEMESTER											Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S			
				—	1-4	—	1-4	—	—	250 Ch.		Adams

14d. Organic Chemistry (Laboratory work).—Organic synthesis, quantitative analysis, qualitative analysis. Continuation of Chemistry 14c, to accompany Chemistry 14b. (Formerly Chemistry 9b.) *I* or *II*; (2).

Prerequisite: Chemistry 9a, 14a; registration in Chemistry 14b, or equivalent.

EITHER SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Chemistry	14d	2	—	1-4	—	1-4	—	—	—	250 Ch.	Kamm Adams

15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic-digestion; intestinal digestion; bile; putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these topics treated thoroughly for prospective students of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Mathews: *Physiological Chemistry*; Hawk: *Practical Physiological Chemistry*. (Open to graduates and undergraduates.) *I*; (5).

Prerequisite: Chemistry 5a or 13a; 9, or 14a-14b.

NOTE: Graduate students should register in laboratory section B.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15	5	Lecture	8	—	8	—	—	—	217 Ch.	Lewis
			A.Laboratory	—	1-4	—	1-4	1-4	—	450 Ch.	
			B.Laboratory	1-4	—	1-4	—	1-4	—	450 Ch.	

15a. Problems of Metabolism.—(Especially for medical students.) Colloids; animal oxidations; osmosis; absorption; selective activity of cells; metabolism; activities of gastro-intestinal tract; enzymes; inorganic nutrition. Lectures; demonstrations; conferences. *II*; (2).

Prerequisite: Chemistry 15.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	15a	2	—	9	—	—	—	—	9	459 Ch.	Lewis

16. Fuel, Gas, and Water Analysis for Engineers.—The proximate analysis of coal; determination of calorific power; technical analysis of furnace gases; examination of boiler waters; lubricating oils. (For students in engineering.) *II*; (3).

Prerequisite: Chemistry 4; junior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	16	3	Lecture	—	—	—	—	8	—	111 Ch.	Parr
			A.Laboratory	—	—	1-3	—	—	8-12	125 Ch.	
			B.Laboratory	—	—	1-5	—	—	8-10	125 Ch.	

17. Teachers' Course.—Methods of teaching Elementary Chemistry. Smith and Hall: *The Teaching of Chemistry and Physics*. *I*; (1).

Prerequisite: 13 hours chemistry and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	17	1	—	—	—	11	—	—	—	255 Ch.	Hopkins

21. Qualitative Organic Analysis.—Systematic methods for identification of pure organic compounds and mixtures. *I*; (2).

Prerequisite: Chemistry 9a, 9b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	21	2	A	1-4	—	1-4	—	—	—	219 Ch.	Kamm
			B	—	1-4	—	1-4	—	—	219 Ch.	

25.¹ Food Analysis.—Quantitative organic analysis, with special reference to the examination of food products: alcohols, carbohydrates, fats and oils, cereals, nitrogenous bodies, preservatives, and colors. Sherman: *Organic Analysis and Food Products*. *I*; (5).

Prerequisite: Chemistry 5a or 13a; 9 or 14a-14b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	25	5	Lecture	—	10	—	10	—	10	111 Ch.	Beal
			Laboratory	1,2,3	—	1,2,3	—	1,2,3	—	216 Ch.	Beal

27. Qualitative Analysis of the Rarer Elements.—The rarer elements and their compounds; identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Lectures and laboratory. *II*; (3).

Prerequisite: Two years' work in chemistry.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	27	3	—	—	11		(Lab. Arrange)			303 Ch.	Sears

¹ Formerly Chemistry 5c.

Chemistry

28. Advanced Qualitative Analysis.—Methods of separation; qualitative reagents; theory of reactions. Designed especially for those intending to teach qualitative chemistry.* Lectures and seminar. *I*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	28	2	---	—	11	—	11	—	—	303 Ch.	Sears

31. Elementary Physical Chemistry.—The more important principles of physical chemistry and electro-chemistry. Lectures; recitations; problems. Washburn: *Principles of Physical Chemistry, II*; (4).

Prerequisite: Chemistry 1, 2a or 3a, 5a, 5b, Physics 1a-1b, or 7a-7b; Mathematics 7 or 8.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	31	4	—	10	—	10	—	10	10	161 Ch.	Tolman

33. Elementary Physical Chemistry.—Molecular weight in gases and solutions; chemical equilibrium; the electrical conductivity of solutions and the attendant phenomena within the solution; thermochemistry. (Laboratory to accompany course 31.) *II*: (2).

Prerequisite: Chemistry 1, 2a or 3a, 5a, 5b; Physics 1a-1b, or 7a-7b; Mathematics 7 or 8.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	33	2	A,Conference	—	8	—	—	—	—		} Von Rossen
			B,Conference	—	9	—	—	—	—		
			C,Conference	—	—	—	8	—	—		
Laboratory, 5 hours either T, W, or T, to be arranged.											

35. Electrochemistry.—The theory of electrochemical reactions. Technical applications of electrochemistry, including electric furnace processes. Lecturer, recitations, laboratory. *I*; (3).

Prerequisite: Chemistry 31, 33.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	35	3	Lecture	—	11	—	11	—	—	161 Ch.	—
			A,Laboratory	1-4	—	—	—	—	—	128 Ch.	—
			B,Laboratory	—	—	1-4	—	—	—	128 Ch.	—

36. **The Phase Rule and its Applications.**—A study of equilibria in heterogeneous systems. Lectures and seminar. *II*; (2).

Prerequisite: Chemistry 31, 33; Mathematics 8, or 7 and 9.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Chemistry	36	2	—			(Arrange)				353 Ch.	Van Rossen

37. Problems in Physical and Electrochemistry.—Work in the library or laboratory with conferences. *I*; (4). *Time to be arranged.* Dr. TOLMAN

Prerequisite: Chemistry 35 or 102a.

45. Advanced Chemical Arithmetic.—Calculations of analytical and industrial chemistry reviewed and classified; use of tables, slide-rules, charts and calculating machines; graphical interpretation of chemical data; lecture, recitation, problems. *I*; (2).

Prerequisite: Senior standing and the consent of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	45	2	—	—	—	11	—	11	204 Ch.	Deming

61. Industrial Chemical Laboratory.—The preparation and purification of chemical products from raw materials on a scale sufficient to afford data for determining the economy of the processes employed. (Should be accompanied by either Chemistry 6 or 109.) *II*; (3).

Prerequisite: Chemistry 5a and 14a.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	61	3	Lecture	—	—	—	11	—	111 Ch.	McFarland
			Laboratory	—	1-4	—	1-4	—	50 Ch.	McFarland Taylor

65. Technical Gas and Fuel Analysis.—Examination of gases, gas mixtures, flue gases and fuels; determination of calorific values; calculation of efficiencies. *I*; (2).

Prerequisite: Chemistry 5a.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	65	2	A,Lecture	1	—	—	—	—	111 Ch.	} Parr
			B,Lecture	—	1	—	—	—	111 Ch.	
			A,Laboratory	2,3	—	1-4	—	—	125 Ch.	
			B,Laboratory	—	2,3	—	1-4	—	125 Ch.	

66. Gas Engineering.—Carbonization processes; ovens and by-products. Lectures; reading; reports. *II*; (1).

Prerequisite: Chemistry 65. Registration in 66a is advised.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	66	1	—	9	—	—	—	—	111 Ch.	Parr

66a. Control Processes in Gas Manufacture.—Standardization methods and inspection. *II*; (1).

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	66a	1	—	1-4	—	—	—	—	162 Ch.	Parr

69. Metallurgical Laboratory and Assaying.—The fire assay of gold, silver, lead, and copper ores, mattes, and bullion; special experiments illustrating the underlying metallurgical principles; fluxes, slags, and charge calculations; practise in the use of coal, oil, and gas furnaces, and in the measurement of high temperatures. Fulton: *Manual of Fire Assaying*. *I*; (2).

Prerequisite: Chemistry 5a; Geology 5.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	69	2	Quiz	—	—	—	—	—	161 Ch.	McFarland
			A,Laboratory	—	—	—	1-6	—	50 Ch.	McFarland
			B,Laboratory	—	—	—	—	1-6	50 Ch.	McFarland

72. Paints, Oils, Turpentine, Varnishes, and Protective Coverings for Wood and Metals.—Lectures and laboratory. *I*; (2).

Prerequisite: Chemistry 5a and 14a-14b.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	72	2	Lecture	—	9	—	—	—	162 Ch.	Parr
			Laboratory	9-12	—	—	—	—	—	—

Chemistry

73. Asphalt, Tar, and Distillation Products.—Sources, characteristics, composition, and examination; binders and dust preventives used in road construction. (For students in highway engineering.) *II*; (2).

Prerequisite: Chemistry 2a or 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	73	2	Lecture	9	—	—	—	—	—	162 Ch.	Parr
			Laboratory	1-4	—	—	—	—	—		

76. Mineral Oils.—Fractionation, analysis evaluation for fuel, lubrication and gas manufacture. *II*; (2).

Prerequisite: Chemistry 9a and 14a.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	76	2	Lecture	—	—	—	9	—	—	162 Ch.	Parr
			Laboratory	—	—	—	—	1-4	—	125 Ch.	Parr

77. Composition and Classification of Coal.—Classification, changes in composition, weathering, spontaneous combustion, formation of mine gases. Lectures; assigned reading. *II*; (1).

Prerequisite: Chemistry 65.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	77	1	—	—	—	—	—	9	—	162 Ch.	Parr

78. Metallography.—Constitution and microstructure of metals and alloys and the relations between their properties, chemical and mechanical treatment, and structure. Lectures; reading; laboratory. *II*; (2).

Prerequisite: Chemistry 7.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	78	2	Conference	—	—	9	—	—	—	111 Ch.	McFarland
			Laboratory	1-4	—	1-4	—	—	—	54 Ch.	McFarland

80. The Elements of Glass Blowing.—A laboratory course in the construction and repair of glass apparatus. *II*; (1). *Time to be arranged.* Mr. ANDERS

Prerequisite: Two years' work in chemistry.

86. The Chemistry of the Higher Order Compounds.—Complex compounds from the standpoint of the Valence Theory as developed by Werner. *II*; (2).

Prerequisite: Chemistry 9a, 9b, 14a-14b.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Chemistry	86	2	—	—	10	—	10	—	—	255 Ch.	Smith

90-91. Chemical Inspection Trips.—Required for juniors and seniors in the courses in chemistry and chemical engineering. For the year 1917-18 the trips will occur on March 25 to 30, 1918. The expense involved will approximate fifteen to twenty-five dollars for each student. *II*; (no credit).

Associate Professor MCFARLAND in charge

92a-92b. Chemical Literature and Reference Work.—Periods, leaders, journals. Required of juniors in chemistry and chemical engineering; required also of juniors who are majoring in chemistry. *I* or *II*; (1).

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	92a	1	—	—	—	—	—	9	201 Ch.	Deming
Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	92b	1	—	—	—	—	—	9	201 Ch.	Deming

93a-93b. Journal Meeting.—Required of seniors and all graduate students in chemistry. All members of the staff of the department of chemistry are expected to attend. *I, II;* (1).

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	93a	1	—	—	—	—	—	11	217 Ch.	—
Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	93b	1	—	—	—	—	—	11	217 Ch.	—

95. History of Chemistry.—Lectures and assigned reading. *I;* (2).

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Chemistry	95	2	—	10	—	10	—	—	255 Ch.	Smith

Courses for Graduates

Graduate students whose major subject is in some department other than chemistry, before taking graduate work for credit in this department, must have had the equivalent of 15 university credits in chemistry, and the ground covered should include satisfactory work in general chemistry and in qualitative and quantitative analysis. Such students are advised to make selections from the following courses: Chemistry 31, 33 (or 102, 102a), 14a, 14b, 9a, 9b, 15 and 25. Courses of a more special nature will not, as a rule, be accepted for graduate work unless preceded by one of the above courses.

For students in agriculture, Chemistry 5a and 13a will not be accepted for graduate credit.

Graduate students who are candidates for an advanced degree in chemistry must have had the equivalent of 25 university credits in chemistry, properly distributed.

For students in chemistry, 5a, 13a, 9, and 9c will not be accepted for graduate credit and 9a, 9b, 14a-14b, 31 and 33 will be accepted only from students entering the Graduate School with the equivalent of 30 university credits in chemistry.

[102. Advanced Physical Chemistry.—This course with 102a, covers a period of two years. In the first year especial attention will be paid to: thermodynamic methods of handling the problems of physical chemistry; the Nernst heat theorem; the concepts of energy, entropy, free energy, thermodynamic potential and fugacity; behavior of pure substances; solutions; heterogeneous systems; and chemical equilibria. Particular practise will be given in the calculation and use of free energy data. *Twice a week; I, II; (¾ unit).* (Not given, 1917-18.)

Prerequisite: Chemistry 1, 2a, or 3a; Physics 1a-1b, 3a-3b, Mathematics 8a or 7 and 9. An elementary knowledge of organic and physical chemistry is desirable.]

102a. Advanced Physical Chemistry.—(Continuation of Chemistry 102.) Special attention will be paid to kinetic-molecular methods of handling the problems of physical chemistry; the kinetic theory of gases, with the relation between entropy and probability; the quantum theory; the molecular structures of liquids and solids; the electron theory. Lectures and seminar. *I, II; (¾ unit).*

Prerequisite: Same as for 102.

Chemistry

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Chemistry	102a $\frac{3}{4}$ unit	—	—	10	—	10	—	—	162 Ch.	Tolman

102b. Advanced Electrochemistry.—The modern theories of solution and the principles of thermodynamics in their application to the problems of electrochemistry; the principles underlying the transformation of chemical and electrical energy. *Three times a week. I; ($\frac{3}{4}$ unit). Time to be arranged.*

Prerequisite: Chemistry 102.

102c. Advanced Problems in Physical and Electrochemistry.—Work in the laboratory or library with conferences. *I; ($\frac{1}{2}$ to 1 unit).*

Prerequisite: Chemistry 31, 33, 102 or 102a.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	102c $\frac{1}{2}$ to 1 unit	—	—	—	—	—	—	—	162 Ch.	Tolman

102e. Special Topic in Physical Chemistry.—Subject for 1917-18: The Theory of Relativity. Tolman: *The Theory of the Relativity of Motion. Once a week; I; ($\frac{1}{2}$ unit).*

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	102e $\frac{1}{2}$ unit	—	—	—	—	—	—	—	162 Ch.	Tolman

[102f. The Chemistry and Physics of Colloids.—The classification of disperse system; adsorption; ultramicroscopy. Electrical, chemical, optical, and catalytic properties of colloids. Seminar; laboratory. *Twice a week; I; ($\frac{3}{4}$ unit).* (Not given, 1917-18; alternates with 102b.)

Prerequisite: Chemistry 31, 33, and 35 or 102b.]

103. Advanced Inorganic Chemistry.—Descriptive inorganic chemistry; the rarer elements; the periodic system. Lectures, with or without laboratory. *Two to five times a week; I, II; ($\frac{1}{2}$ to 1 $\frac{1}{4}$ units).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Chemistry	103 $\frac{1}{2}$ to 1 $\frac{1}{4}$ units	—	—	—	2	—	2	—	255 Ch.	Hopkins

103a. Advanced Analytical Chemistry.—Special topics. Lectures, with or without laboratory. *One to five times a week; II; ($\frac{1}{2}$ to 1 $\frac{1}{4}$ units).*

Prerequisite: Chemistry 5b, 9a, 9b, 14a-14b, 31, 33.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	103a $\frac{1}{2}$ to 1 $\frac{1}{4}$ units	—	—	—	11	—	11	—	255 Ch.	Smith

103b. Special Topics in Inorganic Chemistry.—Subject for 1917-18: The Chemistry of the Higher Order Compounds. Werner: *Neuere Anschauungen auf dem Gebiete der Inorganischen Chemie*; assigned reading from later publications. Lectures; seminar. *I; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 9a, 9b, 14a-14b.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Chemistry	103b $\frac{3}{4}$ unit	—	—	10	—	10	—	—	255 Ch.	Smith

103c. Special Topics in Inorganic Chemistry.—Seminar: Rare earths. *I, II; ($\frac{1}{4}$ unit).*

BOTH SEMESTERS										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103c $\frac{1}{4}$ unit	—	—	—	—	—	—	10	255 Ch.	Hopkins

103d. Special Topic in Inorganic Chemistry.—Subject for 1917-18: Nitrogen and its compounds. The valence and fixation of nitrogen from theoretical and technical standpoints; assigned reading. Lectures; seminar. *I, II; ($\frac{1}{2}$ unit).*

BOTH SEMESTERS										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	103d $\frac{1}{2}$ unit	—	—	—	—	—	10	—	303 Ch.	—

104. Advanced Organic Chemistry.—A systematic study of the more important theoretical considerations in organic chemistry. Geometric isomerism; optical isomerism; tautomerism; mechanisms of important reactions; etc. *I; ($\frac{3}{4}$ unit).*

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104 $\frac{3}{4}$ unit	—	—	11	—	11	—	—	217 Ch.	Adams

104a. Advanced Organic Chemistry.—Special topics in organic chemistry. A selection will be made from the following: carbohydrates, proteins, ureides, alkaloids, terpenes, relationship between color and constitution, physiological properties and chemical constitution, trivalent carbon, bivalent carbon, etc. *II; ($\frac{3}{4}$ unit).*

SECOND SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104a $\frac{3}{4}$ unit	—	—	11	—	11	—	—	217 Ch.	Kamm

104b. Advanced Quantitative Organic Analysis.—Proteins, alkaloids, glucosides, volatile oils, and other constituents of animal and vegetable tissues. Plant analysis. Toxicological analysis. The general methods, chemical and physical, of organic analysis. Lectures and seminar. May be accompanied by laboratory work on a selected group of compounds. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

BOTH SEMESTERS										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104b $\frac{3}{4}$ unit	—	—	—	—	4-6	—	—	263 Ch.	Beal

104c. Organic Chemistry.—Seminar.—A review of the current literature in organic chemistry. *Once every two weeks; I, II; ($\frac{1}{4}$ unit).*

BOTH SEMESTERS										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104c $\frac{1}{4}$ unit	—	—	—	9	—	—	—	255 Ch.	Adams Kamm

104d. Advanced Organic Chemistry.—A systematic study of the benzene, naphthalene, and anthracene compounds, followed by a review of other important cyclic systems as the pyridines, pyrroles, etc. *I; ($\frac{3}{4}$ unit).*

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	104d $\frac{3}{4}$ unit	—	—	9	—	9	—	—	255 Ch.	Adams

105. Advanced Physiological Chemistry.—A more detailed study of the structure and distribution of the proteins. The chemistry of intermediary metabolism and of the glands of internal secretion. Lectures; demonstrations; assigned readings; discussions. *Twice a week; II; ($\frac{3}{4}$ unit).*

Chemistry

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105	$\frac{3}{4}$ unit	—							453 Ch.	Lewis

105a. Advanced Physiological Chemistry.—The more difficult biochemical preparations; the use of analytical methods. Lecture and laboratory. *One to five times a week; I or II; ($\frac{3}{4}$ unit).*

EITHER SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105a	$\frac{3}{4}$ unit	—							453 Ch.	Lewis

105b-105c. Advanced Physiological Chemistry.—Seminar. A consideration of some phases of the recent development of physiological chemistry. *Two hours a week; I, II; ($\frac{1}{2}$ unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105b	$\frac{1}{2}$ unit	—	—	—	—	—	—	9, 10	456 Ch.	Lewis

SECOND SEMESTER

105c	$\frac{1}{2}$ unit	—								456 Ch.	Lewis
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105d. Chemistry of Plant Nutrition.—The occurrence of organic compounds in plants, and their relation to plant nutrition. Lectures; seminar; laboratory. *Two to four times a week; I, II; ($\frac{3}{4}$ to $1\frac{1}{4}$ units).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	105d	$\frac{3}{4}$ - $1\frac{1}{4}$ units	—							—	Muncie

106. Animal Chemistry (Animal Nutrition.)—Recent advances in the chemistry of nutrition of the lower animals; the chemistry of the functional products; the flesh, fat, milk, and wool of the more common domesticated animals. Lectures; conferences; assigned reading; laboratory. *Five times a week; I, II; (1 to $1\frac{1}{2}$ units).*

Prerequisite: Two years' work in chemistry.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	106	1 to $1\frac{1}{2}$ units	—							558 Ag.	Grindley

107. Special Problems in Technology of Fuels.—I; (1 unit).

Prerequisite: Chemistry 77.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	107	1 unit	—	11	—	—	—	—	—	162 Ch.	Parr

108. Advanced Metallography.—Constitution and microstructure of metals and alloys; the relations between their properties, chemical and mechanical treatment, and structure. Assigned reading and laboratory. *Twice a week; I; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 7 and 78 or equivalent.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	108	$\frac{3}{4}$ unit	—							54 Ch.	McFarland

109. Advanced Industrial Chemistry.—Seminar. Some of the more important chemical industries; the development and chemical control of processes. *Twice a week; I, II; ($\frac{3}{4}$ unit).*

Prerequisite: Chemistry 6, 9, 14a-14b, 21 or equivalent.

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	109 $\frac{3}{4}$ unit	—	8	—	8	—	—	—	162 Ch.	McFarland

110. Water Supplies.—An advanced course in the chemistry of water and sewage. The sources of contamination of water supplies and the purification of water for potable or technical use. *One to five times a week, I, II; ($\frac{1}{2}$ to $1\frac{1}{4}$ units).*

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	110 $\frac{1}{2}$ to $1\frac{1}{4}$ units	—					(Arrange)		60-B Ch.	Bartow

111. Research.—A thesis is usually required of students taking the Master's degree and is always required of students taking the degree of Doctor of Philosophy. (For a description of undergraduate work leading to a thesis, see Chemistry 11.) *I, II; (no credit).* Work may be taken in the following subjects:

PHYSICAL AND ELECTROCHEMISTRY	Professor TOLMAN
INORGANIC CHEMISTRY	Assistant Professor SMITH, Dr. HOPKINS, Dr. DEMING
ANALYTICAL CHEMISTRY	Assistant Professor SMITH
FOOD CHEMISTRY	Dr. BEAL
ORGANIC CHEMISTRY	Professor NOYES, Assistant Professor ADAMS, Dr. KAMM
WATER CHEMISTRY	Professor BARTOW
ANIMAL CHEMISTRY (Animal Nutrition)	Professor GRINDLEY
PHYSIOLOGICAL CHEMISTRY	Dr. LEWIS
INDUSTRIAL CHEMISTRY	Professor PARR, Associate Professor MCFARLAND
CERAMIC CHEMISTRY	Professor WASHBURN

BOTH SEMESTERS

Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
Chemistry	111 —	—					(Arrange)		106 Ch.	Noyes and others

CIVIL ENGINEERING

FREDERICK HAYNES NEWELL, B.S., D.Eng., *Professor*
 IRA OSBORN BAKER, B.S., C.E., D.Eng., *Professor*
 CHARLES ALTON ELLIS, A.B., *Professor*
 JAMES ELMO SMITH, B.S., C.E., *Assistant Professor*
 C STANLEY SALE, B.S., *Assistant Professor*
 CARROLL CARSON WILEY, B.S., C.E., *Associate*
 NEAL BRYANT GARVER, B.S., C.E., *Associate*
 WILLIAM HORACE RAYNER, B.S., C.E., *Associate*
 RAYMOND EARL DAVIS, M.S., C.E., *Associate*
 BENJAMIN LESTER BOWLING, *Assistant in Laboratory*

Courses for Undergraduates

27. Plane Surveying.—The theory, use and adjustment of the compass, transit, and level; the computation of areas and volumes and the partitioning of land; map construction, the U. S. land survey methods, re-establishment of corners and boundaries, and interpretation of deeds; farm and city surveying; elements of topographic surveying. Problems with the tape, compass, transit, and level. Breed and Hosmer: *Principles and Practise of Surveying*, Vol. 1. Davis: *Manual of Surveying*. I; (3).

Prerequisite: General Engineering Drawing 1, 2, Mathematics 4.

Civil Engineering

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	27	3	E	8	—	8-11	—	8-11	—	109 E. H.	} Pickles Davis Rayner
			F	10	1-4	—	1-4	—	—	101 E. H.	
			G ₁	1-4	—	1	—	1-4	—	101 E. H.	
			G ₂	1-4	—	1	—	1-4	—	102 E. H.	

28. Higher Surveying.—The theory and use of the transit and plane-table in making topographic surveys; methods; determination of latitude, longitude, and azimuth by stellar and solar observations; topographic drawing; triangulation; barometric, trigonometric, and precise spirit leveling. The use of the aneroid barometer, clinometric, range finder, and sextant in military sketching; outpost and road sketching; military map reading; visibility problems. Breed and Hosmer: *Principles and Practise of Surveying*, Vol. II. Davis: *Manual of Surveying*. II; (3).

Prerequisite: Civil Engineering 27; Physics 1a, 3a, and registration in Physics 1b, 3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	28	3	E	8	—	8-11	—	8-11	—	109 E. H.	} Davis Rayner
			F	10	1-4	—	1-4	—	—	109 E. H.	
			G ₁	1-4	—	1	—	1-4	—	105 E. H.	
			G ₂	1-4	—	1	—	1-4	—	109 E. H.	

31. Surveying.—(For students in landscape architecture.) The theory, use, and adjustment of the compass, level, transit, and plane-table. The determination of distances by pacing, and with chain and tape, and of areas with compass and transit; profile leveling; problems with plane-table. Raymond: *Plane Surveying*. I; (3).

Prerequisite: Mathematics 4; Architecture 31, 32.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	31	3	—	—	8-11	11	8-11	—	—	109 E. H.	Pickles

32. Topographic Surveying.—(For students in landscape architecture.) The theory and use of the stadia; conventional topographical signs; contour construction; its use in grading and drainage problems; advanced work with the plane-table. Each student will prepare a large scale topographic map of a portion of the campus. Raymond: *Plane Surveying*. II; (3).

Prerequisite: Civil Engineering 31.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	32	3	—	—	8-11	11	8-11	—	—	109 E. H.	Pickles

35. Surveying.—(For mining engineering students and others who do not expect to take Civil Engineering 28.) The use and adjustment of the compass, level, transit, and plane-table. The determination of distances with tape and by stadia; the determination of areas with the compass and transit; differential and profile leveling; the U. S. land survey methods; elements of topographical surveying. Breed and Hosmer: *Principles and Practise of Surveying*, Vol. I. Davis: *Manual of Surveying*. I; (3).

Prerequisite: Physics 1b and 3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	35	3	—	10	1-4	—	1-4	—	—	102 E. H.	Rayner

37. Map Reading and Military Sketching.—(For engineering students who have not taken surveying.) Problems in the use and construction of topographic maps; the representation of relief; conventional signs; principles of contour construction; profiles, visibility of lines and areas. The construction of military maps in the field; road, outpost and position sketches; the use of sketch board, the clinometer, the range finder, the aneroid barometer. *II*; (1).

Prerequisite: Sophomore standing in College of Engineering.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	37	1	—	—	—	—	—	—	10, 11	109 E. H.	Davis

51. Railroad Surveying.—Economic location, construction, and maintenance of railways. Curves, turnouts, and earthworks. Preliminary and location surveys of a line of sufficient length to secure familiarity with the methods in actual practise. Each student makes a complete set of maps, profiles, and estimates. Pickels and Wiley: *Railroad Surveying*. *I*; (5).

Prerequisite: Civil Engineering 27, 28.

FIRST SEMESTER											
Subject	No. Credits		Section	M	T	W	T	F	S	Room	Instructor
C. E.	51	5	E	9-12	—	9-11	—	9-12	8, 9	105 E. H.	Smith Wiley
			F	10,11	1-4	—	—	10,11	9-12	204 Road Lab.	
			G	—	1-4	—	1-4	2,3	10,11	105 E.H.	

52. Roads and Pavements.—Construction and maintenance of earth, gravel, macadam, concrete, and bituminous roads; street pavements, and their adaptation to country roads. Road-building machinery. Effect of travel on road surfaces. Dust prevention and street cleaning. Baker: *Roads and Pavements*. *II*; (3).

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2; Civil Engineering 27, 28, 51.

SECOND SEMESTER											
Subject	No. Credits		Section	M	T	W	T	F	S	Room	Instructor
C. E.	52	3	E	9	—	9	—	9	—	101 E. H.	} Smith Wiley Pickels
			F	10	—	10	—	10	—	206 Road Lab.	
			G	11	—	11	—	11	—	101 E. H.	

53. Railroad Surveying.—First eleven weeks of Civil Engineering 51, for juniors in municipal and sanitary engineering. *I*; (3).

Prerequisite: Civil Engineering 27, 28.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	53	3	G	—	1-4	—	1-4	2,3	10,11	105 E. H.	Smith

55. Roads and Pavements.—(For students in landscape gardening.) *I*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	55	2	—	—	—	9	—	9	—	205 E. H.	Baker

57. Stream Flow.—Theory and practise of hydraulics of rivers and smaller streams. The instruments and methods of obtaining climatological data and for measuring stream flow, including use of current meter, float, weir, and various modules. The solution of problems from field data measurement of drainage areas and estimation of discharge. Hoyt & Grover: *River Discharge*. *I*; (2).

Prerequisite: Civil Engineering 28.

Civil Engineering

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	57	2	—	—	8	—	8	—	—	102 E. H.	Davis

58. Graphic Statics.—(For students in mining engineering.) Determination of stresses in roof and bridge trusses and in three-hinged arches. Malcolm: *Elements of Graphic Statics*. II; (2).

Prerequisite: Theoretical and Applied Mechanics 20, 25.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	58	2	—	—	—	2,3	—	2,3	—	211 E. H.	Smith

59. Drainage Engineering.—The present status and importance of the drainage problem; the effect of drainage on the public health; the economics of drainage; surveys and maps of drainage areas; reports on drainage projects; rainfall and run-off; the design, construction, maintenance, and cost of drainage systems; drainage by pumping; vertical drainage; methods of levying assessments for drainage benefits; the promotion of drainage projects; flood protection; channel improvement; the design, construction, and maintenance of levees; the bridging of drainage ditches. I; (2).

Prerequisite: Civil Engineering 27, 28, and 57.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	59	2	—	—	11	—	11	—	—	102 E. H.	Pickels

60. Structural Stresses.—The determination of stresses in roofs, bridges, and steel-skeleton buildings, by algebraic and graphic processes. II; (4).

Prerequisite: Mathematics 2, 4, 6; Theoretical and Applied Mechanics 20, 21, 29, 10; General Engineering Drawing 1, 2.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	60	4	E	10	—	10	—	10	8-11	205, 211 E. H.	Ellis
			F	11	—	11	9-12	11	—	205, 211 E. H.	
			G	9	9-12	9	—	9	—	205, 211 E. H.	

62. Structural Details.—Design of details for roofs, bridges, and steel-frame buildings; detail drawings and shop bills. Carnegie: *Pocket Companion*, last edition. II; (3).

Prerequisite: Registration in Civil Engineering 60.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	62	3	E	—	—	—	—	1-5	—	211 E. H.	Garver
			F	—	—	—	1-5	—	—	211 E. H.	
			G	1-5	—	—	—	—	—	211 E. H.	

70. Seminar.—Reading and discussion of papers. Each student presents one major and two minor papers upon assigned topics, and participates in the discussion of other papers. II; (1).

Prerequisite: Full junior standing in civil engineering.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	70	1	E	1,2	—	—	—	—	—	205 E. H.	Baker
			F	—	—	—	—	1,2	—	219 E. H.	
			G	—	—	1,2	—	—	—	219 E. H.	

76. Surveying.—U. S. public land surveys; principles of re-establishing corners. Use of transit in finding distances, areas, and in laying out buildings; use of the level in finding profiles and contours. Davis: *Manual of Surveying*. II; (2).

Prerequisite: Mathematics 4; General Engineering Drawing 1, 2, Physics 1a-1b, 3a-3b.

SECOND SEMESTER											
Subject	No.	Credit	Section	M	T	W	T	F	S	Room	Instructor
C. E.	76	2	E	—	1,2	—	1,2	—	—	102 E. H.	} Pickels
			F	—	—	10,11	—	10,11	—	102 E. H.	

77. Masonry Construction.—Baker: *Masonry Construction*. I; (4).

Prerequisite: Theoretical and Applied Mechanics 20, 21, 29, 10; Civil Engineering 60.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	77	4	E	11	11	—	11	11	—	219 E. H.	Baker
			F	8	8	—	8	8	—	219 E. H.	

79. Cement Laboratory Practise.—Standard tests for hydraulic cement. I; (1).

Prerequisite: Theoretical and Applied Mechanics, 20, 21, 29, 10; Civil Engineering 60.

Subject	No.	Credit	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	79	1	E	—	—	—	—	1,2	—	Cem. Lab.	Bowling
			F	—	1,2	—	—	—	—	Cem. Lab.	
			T	—	—	1,2	—	—	—	Cem. Lab.	

80. Engineering Contracts and Specifications.—The law of contracts; general and technical clauses used in engineering specifications. Mead: *Contracts, Specifications and Engineering Relations*. II; (2).

Prerequisite: Full senior standing in the College of Engineering.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	80	2	E	—	10	—	10	—	—	205 E. H.	Baker
			F	11	—	11	—	—	219 E. H.		
			T	—	11	—	11	—	205 E. H.		

81. Theory of Reinforced Concrete.—Reinstated concrete beams, columns and slabs. Hool: *Reinforced Concrete Construction*. I; (2).

Prerequisite: Full senior standing in the College of Engineering.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
C. E.	81	2	E	—	9	—	9	—	—	205 E. H.	Ellis
			F	—	11	—	11	—	—	205 E. H.	
			G	11	—	11	—	—	—	205 E. H.	

82. Reinforced Concrete Design.—Plain and reinforced concrete arches, culverts, dams, bridges, and retaining walls. Hool: *Reinforced Concrete Construction*, Vol. III. II; (4).

Prerequisite: Civil Engineering 81.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
C. E.	82	4	F	9-12	—	9-12	—	9-12	—	211 E. H.	Garver

83. Steel Bridge Design.—(For railway civil engineers.) The same as Civil Engineering 85 below but a shorter course. I; (3).

Prerequisite: Civil Engineering 60, 62.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	83	3	F	—	1-4	—	1-4	—	—	214 E. H.	Garver

85. Steel Bridge Design.—Determination of stresses and sections of plate girder and of truss spans; stress sheet, general design, drawings and estimates of weights. *I*; (5).

Prerequisite: Civil Engineering 60, 62.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	85	5	E	—	1-4	—	1-4	—	8-11	211 E. H.	Garver
			F	1-4	—	1-4	—	1-4	—	211 E. H.	

86. Public Service Engineering.—Peculiar relations of the engineer in public employment as contrasted with private work; the organization of engineering work under city, county, state, and federal administration, involving public improvements and the relation with the public through methods of financing the work; preparing plans and considering the public welfare, including bridges, parks, recreation grounds, city planning, etc., *II*; (3).

Prerequisite: Full junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	86	3	—	8	—	8	—	8	—	102 E. H.	Smith

87. Advanced Bridge Analysis.—Continuous, draw, cantilever, suspension and metal-arch bridges. Johnson, Bryan, and Turneaure: *Modern Framed Structures*, Part II. *I*; (2).

Prerequisite: Civil Engineering 60, 62; and registration in Civil Engineering 83 or 85.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	87	2	F	—	10	—	10	—	—	205 E. H.	Ellis

[88. Steel Building Design.—Stresses and sections of the steel frame of mill and office buildings; footings and grillages; design drawings and estimate of weights. *II*; (3). (Not given, 1917-18.)

Prerequisite: Civil Engineering 60, 62.]

89. Hydro-Economics.—The occurrence of water in nature; its conservation, regulation, and use for power and in industries; irrigation, drainage, transportation, domestic supply; the legal title to the use of water. *I*; (2).

Prerequisite: Senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	89	2	—	8	—	8	—	—	—	205 E. H.	Newell

90. Hydro-Economics.—(A continuation of Civil Engineering 89.) *II*; (2).

Prerequisite: Civil Engineering 89.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	90	2	—	—	8	—	8	—	—	205 E. H.	Newell

[91. Highway Bridge Design.—Types of highway bridges; determination of location, size, and type. Steel bridges, beam, low-truss, and through-truss; methods and cost of construction. *I*; (4). (Not given, 1917-18. No. 85 as given above in its place.)

Prerequisite: Civil Engineering 60, 62.]

[92. Concrete Bridges and Culverts.—Reinforced-concrete slab, girder, and arch bridges; falsework and forms; estimates of quantities; costs. *II*; (2). (Not given, 1917-18. No. 82 as given above in its place.)

Prerequisite: Civil Engineering 79, 81.]

93. Road Construction.—Merits of different types of roads and pavements; principles of design; preparation of plans, specifications, and estimates of cost. *I*; (3).

Prerequisite: Civil Engineering 52; Theoretical and Applied Mechanics 21, 29.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	93	3	G	—	9-12	—	9-12	—	—	204 Road Lab.	Wiley

94. Highway Administration.—Road construction and maintenance in Europe and America; taxation and methods of financing road work; the relation of highway improvement to social and economic welfare. *II*; (3).

Prerequisite: Senior standing in civil engineering.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	94	3	G	8	—	8	—	8	—	206 Road Lab.	Wiley

95. Engineering Functions.—The relation of the engineer to his employer, private, corporate, or public. The responsibility of the engineer as an inspector, designer, supervisor of labor, agent, or arbitrator. His functions in valuation proceedings, in investigations, etc. *I*; (2).

Prerequisite: Full junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	95	2	—	—	9	—	9	—	—	102 E. H.	Sale

96 Road Laboratory.—Examining and testing bituminous and non-bituminous road materials; interpretation of the results. *II*; (2).

Prerequisite: Civil Engineering 52, 79; registration in Chemistry 73.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
C. E.	96	2	G	—	—	—	1-4	1-4	—	Road Lab.	Wiley Bowling

97-98. Thesis.—A problem in investigation or design, subject to the approval of the head of the department. Only students of high standing are permitted to take a thesis. *I*; (1); *II*; (2). *Time to be arranged.*

Prerequisite: Full senior standing in civil engineering.

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

Courses for Graduates

Entrance on graduate work in civil engineering presupposes the full undergraduate course in that subject.

101. Irrigation and Drainage.—The survey, examination, construction, maintenance, and operation of works for irrigation and drainage of agricultural lands; water rights. *Twice a week; I, II; (½ unit). Time to be arranged.*

Professor NEWELL

107. Bridge Engineering.—Deflections; the statically indeterminate frame; swing bridges and arches; special graphic methods; suspension bridges; secondary stresses; impact. *Two or three times a week; I, II; (1 unit or more).* *Time to be arranged.* Professor ELLIS

[124. Steel Building Construction.—Steel framing of fireproof office buildings, hotels, and industrial buildings; wind bracing; eccentrically loaded columns; analysis of special details; erection methods and costs. *Twice a week; I, II; (1 unit or more).* (Not given, 1917-18.)]

THE CLASSICS

HERBERT JEWETT BARTON, A.M., *Professor, Chairman*

CHARLES MELVILLE MOSS, Ph.D., *Professor*

WILLIAM ABBOTT OLDFATHER,¹ Ph.D., *Professor*

ARTHUR STANLEY PEASE, Ph.D., *Professor*

HOWARD VERNON CANTER, Ph.D., *Associate Professor*

Major: 20 hours, excluding Greek 1a-1b, 17, 18, and 19.

Minors: 20 hours chosen from foreign languages (Latin being especially recommended), English literature, history, and philosophy.

LATIN

Major: 20 hours, excluding Latin 1a, 1b, 6a, and 12.

Minors: 20 hours chosen from foreign languages (Greek being especially recommended), English literature, history, and philosophy.

CLASSICS

Major: 20 hours in Greek and Latin, excluding Greek 1a-1b, 16, 17, 18, 19, and 20, and Latin 1a, 1b, 6a, 12, 13, and 19. At least six hours shall be carried in the secondary language and the remaining hours in the primary language.

Minors: 20 hours chosen from foreign languages, English literature, history, and philosophy.

GREEK

Courses for Undergraduates

The courses in translation naturally follow each other in the following sequence: 1a-1b, 3, 7 (5), 6 (8). Courses 1a-1b, 3, and 4 are intended for students who cannot present Greek for entrance to the University, but who desire to commence the study of the language. Course 2a-2b, may be taken after course 1a-1b and course 14 after courses 5 or 7. Courses 16, 17, 18, and 19 are open to sophomores, juniors, and seniors; 20 is open to those who have completed one year in history or classics.

1a-1b. Grammar and Reader.—First semester: Attic forms; reading of simple prose. Second semester: Xenophon's *Anabasis*. Book I. *I, II; (4).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	1a	4	—	—	11	11	11	11	—	114 L. H.	Oldfather
SECOND SEMESTER											
Greek	1b	4	Schedule the same as for 1a (first semester).								

¹On leave of absence, second semester.

2a-2b. New Testament Greek.—First semester: Reading of selections.
Second semester: Lectures on Canon and Text. *I, II*; (2).

Prerequisite: Greek 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	2a	2	—	—	10	—	10	—	—	114 L. H.	Moss

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	2b	2	—	Schedule the same as for 2a (first semester).							Moss

3. Second Year Greek.—Xenophon's *Anabasis*, Books II-IV; Grammatical drill. *I*; (3).

Prerequisite: Greek 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	3	3	—	2	—	2	—	2	—	120 L. H.	Pease

4. Second Year Greek.—Homer, six Books of the *Iliad*. *II*; (3).

Prerequisite: Greek 3.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	4	3	—	2	—	2	—	2	—	114 L. H.	—

6. Thucydides.—*The Sicilian Expedition*, Books VI-VII. *I*; (3).

Prerequisite: Greek 4.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	6	3	—	8	—	8	—	8	—	124 L. H.	Moss

8. Plato.—Selected dialogues, including the *Apology* and *Phaedo*. *II*; (3).

Prerequisite: Greek 4.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	8	3	—	9	—	9	—	9	—	114 L. H.	Pease

14. Greek Prose Composition.—*II*; (1).

Prerequisite: Greek 5 and 6 or 7 and 8.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	14	1	—	—	—	—	—	11	—	120 L. H.	Moss

Greek Life and Literature in English

(Courses 16-20 presuppose no knowledge of Greek and are open to all students except freshmen).

16. The Private and Public Life of the Greeks.—Lectures illustrated by photographs and slides; prescribed readings. *I*; (1).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	16	1	—	—	—	—	3	—	—	120 L. H.	Moss

17. Greek Poetry in Translations.—*I*; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	17	2	—	—	11	—	11	—	—	124 L. H.	Moss

18. Greek Prose in Translations.—*II*; (2).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	18	2	—	11	—	11	—	—	—	120 L. H.	Moss

19. Greek Drama in Translations—II; (2).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	19	2	—	—	11	—	11	—	—	124 L. H.	Moss

20. Greek History.—(This course is described by the department of history as History 5). I; (3).

Prerequisite: One course in history or the classics. Not open to freshmen.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Greek	20	3	—	3	—	3	—	3	—	120 L. H.	Oldfather

Courses for Graduates

105. Plato and Aristotle.—Selections from the political and ethical writings. I; (1 unit). Time to be arranged. Professor OLDATHER

107. Greek Oratory.—One or more speeches of each of several orators; lectures and reports. I, II; (1 unit).

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Greek	107	1 unit	—	—	8	—	8	—	—	104 L. H.	Moss

110. Bibliography and Criticism.—(Thesis course.)—Once a week; I, II; (1 unit).

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Greek	110	1 unit	—	2	—	—	—	—	—	104 L. H.	Oldfather Pease Canter and others

LATIN

6. Cicero.—Selections from the *Orations*. I; (4).

Prerequisite: Two entrance units in Latin.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	6	4	—	—	8	8	8	8	—	114 L. H.	—

1a-1b. Ovid and Virgil.—First semester: Selections from the *Amores*, *Heroides*, and *Metamorphoses*. Second semester: Selections from the *Aeneid*. I, II; (4).

Prerequisite: Three entrance units in Latin.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	1a	4	—	—	8	8	8	8	—	120 L. H.	Pease

				SECOND SEMESTER	
Latin	1b	4	Schedule the same as for 1a (first semester).		

2a-2b. Livy, Plautus, and Terence.—First semester: Selections from Livy, the story of Hannibal. Second semester: The *Captivi* and *Rudens* of Plautus and the *Phormio* of Terence. I, II; (4).

Prerequisite: Four entrance units in Latin.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	2a	4	—	—	9	9	9	9	—	120 L. H.	Barton

SECOND SEMESTER
Schedule the same as for 2a (first semester).

3. **Sallust and Cicero.**—Selections from the *Jugurthine War*; *De Senectute*. I; (3).

Prerequisite: Latin 2a-2b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	3	3	—	9	—	9	—	9	—	114 L. H.	Canter

4. **Horace and Catullus.**—Selections. II; (3).

Prerequisite: Latin 2a-2b.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	4	3	—	10	—	10	—	10	—	120 L. H.	Canter

- 5a-5b. **Latin Composition.**—Grammatical drill and practise in the simpler forms of expression. I, II; (1).

Prerequisite: Latin 1a-1b or its equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	5a	1	—	8	—	—	—	—	—	120 L. H.	Canter

SECOND SEMESTER
Schedule the same as for 5a (first semester).

Roman Life and Literature in English

(Courses 12 and 13 presuppose no knowledge of Latin; open to all students except freshmen).

12. **Virgil and Horace in English Translations.**—The *Aeneid* and selections from Horace. I; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	12	2	—	—	3	—	3	—	—	114 L. H.	Barton

13. **Roman Life.**—The family, organization of society, education, marriage, amusements, with some attention to the monuments. Lectures and assigned readings illustrated by photographs and slides. II; (1).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	13	1	—	—	—	—	3	—	—	202 L. H.	Barton

19. **Roman History.**—(This course is described by the department of history as History 6). Not open to freshmen. II; (3).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	19	3	—	2	—	2	—	2	—	120 L. H.	Canter

9. **Teachers' Course.**—The purpose and methods of preparatory Latin instruction; the teacher's preparation. II; (2).

Prerequisite: Eighteen hours in Latin. A portion of this requirement may be waived in the case of those who have taught Latin.

Subject	No. Credits	Section	SECOND SEMESTER					Room	Instructor
			M	T	W	T	F		
Latin	9	2	—	11	—	11	—	120 L. H.	Barton

10. Latin Composition.—The leading principles; imitation of assigned models. *I*; (2).

Prerequisite: Twelve hours in Latin, including Latin 5a-5b or its equivalent.

Subject	No. Credits	Section	FIRST SEMESTER					Room	Instructor
			M	T	W	T	F		
Latin	10	2	—	11	—	11	—	120 L. H.	Barton

Courses for Advanced Undergraduates and Graduates

8. Tacitus.—The *Annals*, Books I-VI. *I*; (3).

Prerequisite: Twelve hours in Latin.

Subject	No. Credits	Section	FIRST SEMESTER					Room	Instructor
			M	T	W	T	F		
Latin	8	3	—	10	—	10	—	114 L. H.	Pease

16. Martial and Suetonius.—Selections; lectures on literary history. *II*; (3).

Prerequisite: Eighteen hours in Latin.

Subject	No. Credits	Section	SECOND SEMESTER					Room	Instructor
			M	T	W	T	F		
Latin	16	3	—	10	—	10	—	114 L. H.	Barton

22. Late Latin.—Rapid reading of selections from the Latin writers from Minucius Felix to Cassiodorus. *II*; (2).

Prerequisite: This course is open to seniors and graduates who have had two years of college Latin or who otherwise satisfy the instructor of their ability to do the work required.

Subject	No. Credits	Section	SECOND SEMESTER					Room	Instructor
			M	T	W	T	F		
Latin	22	2	—	2	—	2	—	124 L. H.	Pease

Courses for Graduates

Students desiring to take graduate work in Latin should have had at least three years of college Latin in addition to the Latin presented to meet entrance requirements.

103. Cicero.—*De Natura Deorum* and *De Divinatione*. Twice a week; *II*; (1 unit).

Subject	No. Credits	Section	SECOND SEMESTER					Room	Instructor
			M	T	W	T	F		
Latin	103	1 unit	—	9	—	9	—	114 L. H.	Pease

104. Latin Paleography.—Twice a week. *I*; (1 unit).

Subject	No. Credits	Section	FIRST SEMESTER					Room	Instructor
			M	T	W	T	F		
Latin	104	1 unit	—	10	—	10	—	104 L. H.	Pease

107. Latin Epigraphy.—Twice a week, *II*; ($\frac{1}{2}$ to 1 unit). Time to be arranged.
Professor PEASE

108. Tacitus.—*The Histories*. Twice a week; *I*; (1 unit).

Comparative Philology

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Latin	108	1 unit	—	—	2	—	2	—	—	114 L. H.	Barton

109. Virgil.—*Twice a week; II; (1 unit). Time to be arranged.*

Professor PEASE

110. Bibliography and Criticism.—(Thesis course.) *Once a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Latin	110	1 unit	—	2	—	—	—	—	—	104 L. H.	Oldfather Pease Canter and others

113. Plautus.—*Twice a week; I; (1 unit). Time to be arranged.*

Professor OLDFATHER

112. Roman Historiography.—*Twice a week; I; (1 unit). Time to be arranged.*

Associate Professor CANTER

COMMERCIAL LAW

(See BUSINESS ORGANIZATION AND OPERATION)

COMPARATIVE LITERATURE

JOSEPH EUGENE GILLET, Ph.D., *Associate in Comparative Literature and Romance Languages.*

1. Tragedy.—Theory and practise from classical times to the present day. Lectures; readings; reports. *I; (3).*

Prerequisite: Two years of college work, or the permission of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Comparative Literature	1	3	—	9	—	9	—	9	—	205 L. H.	Gillet

2. Comedy.—Theory and practise from classical times to the present day. Lectures; readings; reports. *II; (3).*

Prerequisite: Two years of college work, or the permission of the instructor.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Comparative Literature	2	3	—	9	—	9	—	9	—	205 L. H.	Gillet

COMPARATIVE PHILOLOGY

LEONARD BLOOMFIELD, Ph.D., *Assistant Professor of Comparative Philology and German*

For Advanced Undergraduates and Graduates

1. Introduction to the Study of Language.—Phonetics; the development of forms of speech; dialects and the spread of languages; the study and teaching of language. *I; (3).*

Prerequisite: The consent of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Comparative Philology	1	3	—	11	—	11	—	11	—	124 L. H.	Bloomfield

Dairy Husbandry

2. Comparative Philology of the Indo-European Languages.—Attention will be given chiefly to Greek, Latin, and the Germanic languages, including English. *II*; (2).

Prerequisite: The consent of the instructor.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Philology	2	2	—	—	11	—	11	—	—	—
										Instructor Bloomfield

3. Elementary Sanskrit.—Reading and grammar. *I*; (3).

Prerequisite: The consent of the instructor.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Philology	3	3	—	10	—	10	—	10	—	124 L. H.
										Instructor Bloomfield

4. Elementary Sanskrit.—(Continuation of Comparative Philology 3.) *II*; (3).

Prerequisite: Comparative Philology 3.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Comparative Philology	4	3	—	10	—	10	—	10	—	—
										Instructor Bloomfield

DAIRY HUSBANDRY

HARRY ALEXIS HARDING, Ph.D., *Professor, Dairy Bacteriology*

WILBUR JOHN FRASER, M.S., *Professor, Dairy Farming*

NELSON WILLIAM HEPBURN, M.S., *Assistant Professor, Dairy Manufactures*

MARTIN JOHN PRUCHA, Ph.D., *Assistant Professor, Dairy Bacteriology*

RAY STILLMAN HULCE, M.S., *Associate, Milk Production*

HARRISON AUGUST RUEHE, M.S., *Associate, Dairy Manufactures*

WILLIAM WODIN YAPP, M.S., *Instructor, Dairy Husbandry*

PAUL WILLIAM ALLEN, M.S., *Instructor, Dairy Bacteriology*

LEIGHTON J TRUE, B.S., *Instructor, Dairy Manufactures*

— *Associate, Dairy Chemistry*

1. Milk Testing.—Babcock test; tests for purity and adulteration; lactometer; tests for acidity, moisture, and salt; qualitative separation of milk into its components, and a brief study of the components; significance of the composition of milk. Lectures; recitations; problems; laboratory. *I* or *II*; (3).

EITHER SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Dairy Husbandry	1	3	A	8,9	—	8,9	—	8,9	—	503 Ag.
										Instructor —
										503 Ag.

2. Dairy Cattle.—Selection, feeding, and management; dairy type and its relation to production; herd improvement; feeding considerations for production, for development; history, characteristics, and adaptability of breeds; milking machines; barn arrangements; herd management. Students having credit in Dairy Husbandry 16 should register for laboratory work only, for which they will receive two hours' credit. All others must register for both lectures and laboratory. Lectures; recitations; laboratory. *I*; (5).

Prerequisite: Animal Husbandry 5, 8, and 21, or their equivalent.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Dairy	2	5	—	8	—	8	—	8	—	455 Ag.	Hulce
Husbandry				—	8,9	—	8,9	—	—	S. P.	Yapp

3. Elements of Dairy Husbandry.—The dairy herd; dairy sanitation; milk testing; milk; milk products. Required of all freshmen in the general curriculum in agriculture. Lectures; demonstrations. *I* or *II*; (1).

EITHER SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Dairy	3	1	A	11	—	11	—	—	—	128 Ag.	Yapp
Husbandry			B	1	—	1	—	—	—	128 Ag.	and others

4. Ice Cream Making.—Mixing and freezing of ice cream, sherbets, and other frozen products, and the physical principles involved; types of freezers; flavoring materials, fillers, and binders; ice cream standards; the theory and practise of artificial refrigeration, and its use in the ice cream plant. This course is accompanied by one inspection trip, costing from \$10 to \$15. *I* or *II*; (3).

Prerequisite: Dairy Husbandry 1 or 5.

EITHER SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Dairy	4	3	—	—	10,11	—	10,11	—	10,11	455 Ag.	Ruehe
Husbandry											

5. The Composition of Dairy Products.—Rapid commercial tests; qualitative and quantitative study; the composition of milk proteins and their significance; composition, chemical and physical properties of milk fat and factors influencing them. Lectures; recitations; problems; assigned reading; laboratory. *II*; (3).

Prerequisite: Chemistry 13a. It is desirable that students registering in this course take Chemistry 9 or its equivalent, which after 1919-20 will be made a prerequisite.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Dairy	5	3	—	10,11	—	10,11	—	10,11	—	503 Ag.	—
Husbandry											

6.¹ Germ Life and the Dairy.—Designed primarily to acquaint students with the general relation of bacteriology to dairy problems. Lectures; assigned readings. *I*; (1).

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Dairy	6	1	—	—	—	—	—	3	—	128 Ag.	Harding
Husbandry											Allen

7. Creamery Buttermaking and Factory Management.—Types of creameries; raw product received; grading; pasteurization; use of commercial starters; ripening, churning, salting, and working butter; butter composition and scoring; explanation of various physical phenomena in making, packing, and storing of butter; creamery by-products; refrigeration. Creamery location and plans; business management and accounting of various types of creameries. This course is accompanied by one inspection trip costing from \$10 to \$15. Lectures; laboratory. *II*; (5).

Prerequisite: Dairy Husbandry 1. After 1918-19 Accountancy 1a and 1b will be made prerequisite. After 1918-19 the requirements will be Dairy Husbandry 5 and Accountancy 1a and 1b.

¹Not open for credit to students who have taken Bacteriology 1 or 5.

Dairy Husbandry

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Dairy Husbandry	7	5	—	1,2	1,2	1,2	1,2	1,2	8-11	455 Ag.	Hepburn Ruehe

8. City Milk Supply.—Production, transportation, plant, and delivery. *II*; (2).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Dairy Husbandry	8	2	—	8	—	—	—	8	—	456 Ag.	Harding True

11. Dairy Bacteriology.—The bacteria of milk and its products; methods of introduction, effect, and methods of control. Lectures. *I*; (2).

Prerequisite: Bacteriology 1 or 5; two years of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Dairy Husbandry	11	2	—	8	—	—	—	8	—	456 Ag.	Harding Allen

12a-12b. Dairy Bacteriology.—The bacteria in milk and its products. Laboratory. *I, II*; (4).

Prerequisite: Bacteriology 1 or 5; two years of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Dairy Husbandry	12a	4	—	—	8,9	8,9	8,9	—	8,9	456 Ag.	Harding Allen

				SECOND SEMESTER	
Dairy	12b	4	Schedule the same as for 12a (first semester).		
Husbandry					

13. General Course in Dairy Manufactures.—Milk production, care, and distribution; handling cream on the farm; care and use of the hand separator; a study of various makes of machines; making and marketing butter under farm conditions; soft cheese; Neufchatel; cream; pimento; cottage; manufactured milk drinks; ice cream making; plans and equipment for the farm dairy. This course is offered especially for the student who has only a general interest in the subject of dairy manufactures. The subject will be treated chiefly from the farm point of view. *I*; (3).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Dairy Husbandry	13	3	—	1,2	—	1	—	1,2	—	455 Ag.	Hepburn Ruehe and others

14. Milk Condensing.—Lectures, laboratory exercises. Making various kinds of condensed milk; processing; milk powder; condensing plants and their equipment. This course requires one inspection trip costing from \$10 to \$15. *II*; (2).

Prerequisite: Dairy Husbandry 1 or 5.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Dairy Husbandry	14	2	—	—	3	—	2-6	—	—	455 Ag.	Ruehe

17. Advanced Study of Dairy Breeds.—History; environment; breed characteristics; prominent families and individuals; pedigree work with emphasis on performance records; reliability of official tests; systems of advanced registry; problems peculiar to the breeder of pure-bred dairy cattle. Lectures; assigned reading; seminar work. *II*; (2).

Prerequisite: Two years of University work; Animal Husbandry 8; Dairy Husbandry 2.

Dairy Husbandry

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	17	2	—	—	3	—	3	—	—	455 Ag.	Yapp

20. Economic Problems in Dairy Farming.—A proper balance of the different factors of production on a dairy farm; its bearing on profits; the size of farms; farm labor; the relation of the people to the land. *I*; (3).

Prerequisite: Two years of university work, 4 hours in Dairy Husbandry, and Economics 1 or 2.

				FIRST SEMESTER							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	20	3	—	11	—	11	—	11	—	107 Gen.	Fraser

21. Systems of Dairy Farming.—Relation of the cow and the herd to profits; how to establish and perpetuate a dairy herd of the highest efficiency; economy crops and rations on a dairy farm; systems of cropping; the organization of a dairy farm; location and arrangement of buildings and lots; farm accounts, records, and inventories; markets; care and disposal of milk at the greatest profit. A three-day inspection trip is required in this course, the expense of which is about \$17. *II*; (5).

Prerequisite: Dairy Husbandry 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	21	5	—	10	10	10	10	10	—	Morrow Hall	Fraser

22. Cheese Making.—Lectures, laboratory exercises. Practise in making the more common varieties of hard and soft cheese. *I*; (2).

Prerequisite: Dairy Husbandry 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	22	2	—	—	1,2	—	1-4	—	—	455 Ag.	Ruehe

23a-23b. Investigation and Thesis.—*I, II*; (5-10).¹

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Dairy Husbandry	23a	5-10 ¹	—				(Arrange)			120 Ag.	Harding Fraser Hepburn Hulce
SECOND SEMESTER											
Dairy Husbandry	23b	5-10 ¹	—				(Arrange)			120 Ag.	

Courses for Graduates

101. Economic Milk Production.—Differences in the efficiency of dairy cows, the cause and effect of these differences and their relation to successful dairy farming. *Twice a week; I, II; (1 unit). Time to be arranged.* Professor FRASER

104. Scientific Readings.—Reading and discussion of some German or French bacteriological text. Designed to broaden the outlook in bacteriology and to quicken the ability to read. Recommended for first and second year students. *Once a week; I, II; (½ unit). Time to be arranged.*

Professor HARDING, Assistant Professor PRUCHA

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Drawing, General Engineering

105. Bacteriological Literature.—Assigned systematic readings designed to cover a portion or the entire field of dairy bacteriology. Each student will be required to prepare and deliver an acceptable course of lectures. Recommended for second and third year students. *Once a week, or once in two weeks; I, II; ($\frac{1}{2}$ or 1 unit).*
Time to be arranged. Professor HARDING

106. Research on Assigned Problems.—Open to graduate students whose development permits their undertaking problems of dairy bacteriology with only general supervision. A study of the literature of the selected problem followed by laboratory study and reports. *I, II; ($\frac{1}{2}$ to 2 units).* Time to be arranged.

Professor HARDING, Assistant Professor PRUCHA

107. Dairy Chemistry.—A survey of the literature; special investigation on assigned problems. *Once a week; I, II; (1 unit).*

DRAWING, GENERAL ENGINEERING

HARVEY HERBERT JORDAN, B.S., *Assistant Professor*

FRANCIS MARION PORTER, M.S., *Associate*

RUFUS CRANE, A.B., B.S., *Instructor*

CLARENCE ALLEN ATWELL, B.S., *Instructor*

MERTON FORD BANKS, *Instructor*

LEO STARR BALDWIN, *Instructor*

ROBERT EMMET MURPHY, *Half-time Assistant*

1. Elements of Drafting.—Lettering; isometric oblique and perspective drawing, orthographic projection; machine sketching; working drawings. Lettering; mechanical styles and the making of name plates and titles. Mechanical drawing; 12 plates from copy and 6 plates from models, with tracings of each. Dimensioned sketches from parts of standard machines; complete working drawings. Tracings duplicated in blue-print form. Time sketches of equipment. Miller: *Mechanical Drafting*. *I or II; (4).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
G. E. D.	1	4	A	8-11	—	8,9	—	8-11	—	303 T. B.	} Jordan and others
			B	1-4	—	1,2	—	1-4	—	303 T. B.	
			C	—	8-11	—	8-11	—	8,9	303 T. B.	
			D	—	1-4	—	1-4	—	10,11	303 T. B.	
			SECOND SEMESTER								
			D	—	1-4	—	1-4	—	10-12	305 T. B.	Jordan and others

2. Descriptive Geometry.—The point, line, and plane; the properties of surfaces; intersections and developments (for architects, perspective instead of intersections and developments). Practical problems; recitations. Three drawing room plates, 2 hours each, 5 problems per plate, and 2 home plates, 5 problems each per week. Miller: *Descriptive Geometry*. *I or II; (4).*

Prerequisite: Solid geometry, college algebra, plane trigonometry.

Subject	No.	Credits	Section	EITHER SEMESTER							Room	Instructor
				M	T	W	T	F	S			
G. E. D.	2	4	A	8-11	—	8,9	—	8-11	—		306 T. B.	Jordan and others
			B	1-4	—	1,2	—	1-4	—		306 T. B.	
			C	—	8-11	—	8-11	—	8,9		306 T. B.	
			D	—	1-4	—	1-4	—	10,11		306 T. B.	

21. Advanced Descriptive Geometry.—Review of course 2; the cylinder, cone, convolute, and warped surface; intersections of these surfaces in pairs, and by planes; planes tangent; developable and approximately developable surfaces and doubly curved and complex surfaces of revolution; practical applications and methods. *II*; (2).

Prerequisite: General Engineering Drawing, 1, 2.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
G. E. D.	21	2	—	—	—	—	2,3	2,3	8-12	303 T. B. Porter

(Any 4 hours from above schedule.)

ECONOMICS

(See also BUSINESS ORGANIZATION AND OPERATION and TRANSPORTATION)

DAVID KINLEY, Ph.D., LL.D., *Professor*

MAURICE HENRY ROBINSON, Ph.D., *Professor*

ERNEST LUDLOW BOGART, Ph.D., *Professor*

CHARLES MANFRED THOMPSON, Ph.D., *Associate Professor*

NATHAN AUSTIN WESTON, Ph.D., *Assistant Professor*

SIMON LITMAN, Dr.Jur.Pub.et Rer.Cam., *Assistant Professor*

JOHN GIFFEN THOMPSON, Ph.D., *Instructor*

CHARLES LESLIE STEWART, Ph.D., *Instructor*

HENRY ELMER HOAGLAND, Ph.D., *Instructor*

MERVIN HAROLD HUNTER, Ph.D., *Instructor*

GORDON WATKINS, A.M., *Instructor*

WALTER WILSON JENNINGS, A.M., *Assistant*

WILLIAM HENRY DREESEN, A.M., *Assistant*

Major: For students in the College of Liberal Arts and Sciences twenty hours, made up of Economics 1 and any other courses in economics for which it is a prerequisite.

Minor: Twenty hours in any one or two of the following subjects: history, philosophy, political science, and sociology.

Economics 7, 22, and 26 are open to freshmen without previous requirement. Economics 27 is also open to freshmen, but requires credit in course 26 or an approved high school course in commercial geography.

Economics 1 and 3 are the fundamental courses in economics. They are prerequisites for most of the advanced courses and students expecting to do advanced work in economics should take them both in their sophomore year.

Economics 2, though open to all students who have had 30 hours of university work, is primarily for students in the Colleges of Agriculture and Engineering and in courses in household science, chemistry, chemical engineering, and other sciences. It may not be used as a prerequisite for advanced courses in economics except as indicated.

Courses for Undergraduates

1. Principles of Economics.—(See note preceding the description of courses in economics above.) *I*; (5).

Prerequisite: Thirty hours of university work.

Economics

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	1	5	A, Discussion	—	—	—	—	8	—	100 Com.	Thompson, C. M.
			B, Discussion	—	—	—	—	9	—	100 Com.	Thompson, C. M.
			C, Discussion	—	—	—	—	10	—	100 Com.	Weston
			D, Discussion	—	—	—	—	11	—	100 Com.	Weston
			A ₁ , Quiz	8	8	8	8	—	—	101 Com.	Thompson, C. M.
			A ₂ , Quiz	8	8	8	8	—	—	111 Com.	Jennings
			A ₃ , Quiz	8	8	8	8	—	—	204 Com.	Hunter
			A ₄ , Quiz	8	8	8	8	—	—	308 Com.	—
			B ₁ , Quiz	9	9	9	9	—	—	308 Com.	Hoagland
			B ₂ , Quiz	9	9	9	9	—	—	111 Com.	Watkins
			B ₃ , Quiz	9	9	9	9	—	—	307 Com.	Dreesen
			B ₄ , Quiz	9	9	9	9	—	—	210 Com.	—
			C ₁ , Quiz	10	10	10	10	—	—	206 Com.	Thompson, J. G.
			C ₂ , Quiz	10	10	10	10	—	—	111 Com.	Hoagland
			C ₃ , Quiz	10	10	10	10	—	—	307 Com.	Stewart
			C ₄ , Quiz	10	10	10	10	—	—	308 Com.	—
			D ₁ , Quiz	11	11	11	11	—	—	101 Com.	Watkins
			D ₂ , Quiz	11	11	11	11	—	—	111 Com.	Stewart
			D ₃ , Quiz	11	11	11	11	—	—	206 Com.	Thompson, J. G.
			D ₄ , Quiz	11	11	11	11	—	—	307 Com.	—

2. Principles of Economics.—(See note preceding the description of courses in economics above.) *II*; (3).

Prerequisite: Thirty hours of university work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	2	3	A ₁	8	—	8	—	8	—	101 Com.	Hoagland
			A ₂	8	—	8	—	8	—	111 Com.	Jennings
			A ₃	8	—	8	—	8	—	204 Com.	Watkins
			B ₁	10	—	10	—	10	—	101 Com.	Stewart
			B ₂	10	—	10	—	10	—	111 Com.	Jennings
			B ₃	10	—	10	—	10	—	204 Com.	Watkins
			B ₄	10	—	10	—	10	—	307 Com.	—
			C ₁	11	—	11	—	11	—	101 Com.	Thompson, C. M.
			C ₂	11	—	11	—	11	—	111 Com.	Hunter
			C ₃	11	—	11	—	11	—	307 Com.	—
			D ₁	1	—	1	—	1	—	101 Com.	Thompson, J. G.
			D ₂	1	—	1	—	1	—	204 Com.	Hunter
			D ₃	1	—	1	—	1	—	210 Com.	—

3. Money and Banking.—(See note preceding the description of courses in economics above.) *II*; (3).

Prerequisite: Economics 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	3	3	A, Discussion	—	9	—	—	—	—	100 Com.	Weston
			B, Discussion	11	—	—	—	—	—	100 Com.	Weston
			A, Quiz	—	—	—	8	—	8	308 Com.	Hunter
Students electing quiz sections A to E must take discus- sion A; those electing quiz sec- tions F to J must take discussion B.			B, Quiz	—	—	—	8	—	8	307 Com.	Stewart
			C, Quiz	—	—	—	8	—	8	111 Com.	—
			D, Quiz	—	—	—	9	—	9	202 Com.	Watkins
			E, Quiz	—	—	—	9	—	9	308 Com.	—
			F, Quiz	—	—	11	—	11	—	206 Com.	Watkins
			G, Quiz	—	—	11	—	11	—	202 Com.	Stewart
			H, Quiz	—	—	11	—	11	—	312 Com.	—
			I, Quiz	—	11	—	11	—	—	111 Com.	Hunter
			J, Quiz	—	11	—	11	—	—	202 Com.	—

7. English Economic History.—Open to freshmen and sophomores only. *I;* (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	7	3	Lecture	9	—	—	—	—	—	100 Com.	Bogart
			A,Quiz	—	—	9	—	9	—	101 Com.	Bogart
			B,Quiz	—	9	—	9	—	—	101 Com.	Bogart

16c. Agricultural Economics.—The application of the principles of economics to the problems of agriculture. *II;* (3).

Prerequisite: Economics 1 or 2.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	16c	3	—	3	—	3	—	3	—	206 Com.	Thompson, J. G.

22. The Economic History of the United States.—Open to freshmen only. *II;* (3).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	22	3	A	8	—	8	—	8	—	206 Com.	Hunter
			B	—	8	—	8	—	8	206 Com.	Dreesen
			C	—	8	—	8	—	8	204 Com.	—
			D	9	—	9	—	9	—	101 Com.	Bogart
			E	9	—	9	—	9	—	111 Com.	Thompson, C. M.
			F	—	9	—	9	—	9	101 Com.	Dreesen
			G	—	9	—	9	—	9	111 Com.	Jennings
			H	—	10	—	10	—	10	204 Com.	Thompson, J. G.
			I	2	—	2	—	2	—	101 Com.	Watkins
			J	2	—	2	—	2	—	204 Com.	—
			K	3	—	3	—	3	—	101 Com.	Jennings

23. Statistics.—Sources of statistical data; purposes of statistics; preparation of schedules; analysis of returns; methods of computing averages and index numbers; construction and use of frequency tables; graphic methods and their uses; limitations of statistics; application of statistical methods to current problems. *II;* (3).

Prerequisite: Economics 1.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	23	3	Lecture	9	—	—	—	—	—	100 Com.	Hoagland
			A, Quiz	—	—	9	—	9	—	307 Com.	Hoagland
			B, Quiz	—	9	—	9	—	—	307 Com.	Hoagland

26. Economic Resources.—Environment influences affecting commercial and industrial development; products and industries of different countries, especially of the United States. Open to freshmen and sophomores only. *I;* (3).

Economics

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
(The following sections are open to freshmen only.)											
Economics	26	3	A	8	—	8	—	8	—	202 Com.	Dreesen
			B	9	—	9	—	9	—	202 Com.	Stewart
			C	10	—	10	—	10	—	202 Com.	Litman
			D	—	10	—	10	—	10	202 Com.	Hunter
			E	11	—	11	—	11	—	202 Com.	Jennings
			F	—	11	—	11	—	11	202 Com.	Jennings
			G	2	—	2	—	2	—	202 Com.	Hunter
(The following sections are open to sophomores only.)											
			H	1	—	1	—	1	—	204 Com.	Dreesen
			I	1	—	1	—	1	—	202 Com.	—
			J	—	10	—	10	—	10	204 Com.	Jennings

27. Modern Industries.—The raw materials of commerce; their geographical distribution and economic significance; the leading industries; the stages of production; the distribution of finished commodities. *Open to freshmen and sophomores only. II; (3).*

Prerequisite: Economics 26, or an approved high school course in commercial geography.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	27	3	Lecture	10	—	—	—	—	—	100 Com.	Litman
			A, Quiz	—	—	10	—	10	—	202 Com.	Litman
			B, Quiz	—	10	—	10	—	—	202 Com.	Dreesen

32. Marketing Farm Produce.—*II; (2).*

Prerequisite: Economics 1 or 2.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	32	2	—	—	3	—	3	—	—	111 Com.	Stewart

33. Economics of Insurance.—The historical development and economic aspects of insurance. *I; (2).*

Prerequisites: Economics 1 and 3.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	33	2	—	—	9	—	9	—	—	100 Com.	Robinson

34. Property Insurance.—Fire, marine, title, and credit insurance and corporate suretyship. *II; (2).*

Prerequisite: Economics 1 and 3.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	34	2	—	—	9	—	9	—	—	204 Com.	Robinson

35. Corporations.—The organization and financial management of corporations. *Open to junior and senior engineering students only. I; (3).*

Prerequisite: Economics 1 or 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	35	3	—	10	—	10	—	10	—	204 Com.	Robinson

Courses for Undergraduates and Graduates

4. Financial History of the United States.—*I; (3).*

Prerequisite: Economics 1 and 3; senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	4	3	—	8	—	8	—	8	—	206 Com.	Watkins

5. Public Finance.—I; (3).*Prerequisite:* Economics 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	5	3	—	10	—	10	—	10	—	101 Com.	Bogart

8. The Money Market.—II; (2).*Prerequisite:* Economics 1 and 3, Business Organization and Operation 1, senior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	8	2	—	—	11	—	11	—	—	206 Com.	Weston

9. Practical Banking.—Banking practise in the United States. I; (2).*Prerequisite:* Economics 1 and 3; Business Organization and Operation 1; senior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	9	2	—	—	11	—	11	—	—	204 Com.	Weston

10. Corporation Management and Finance.—II; (3).*Prerequisite:* Economics 1 and 3.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	10	3	Lecture	—	—	11	—	11	—	100 Com.	Robinson
			A,Quiz	11	—	—	—	—	—	312 Com.	
			B,Quiz	—	11	—	—	—	—	101 Com.	
			C,Quiz	—	—	—	11	—	—	101 Com.	
			D,Quiz	10	—	—	—	—	—	202 Com.	

11. Industrial Consolidation.—The growth of monopoly. I; (3).*Prerequisite:* Economics 10.

				FIRST SEMESTER							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	11	3	—	9	—	9	—	9	—	312 Com.	Robinson

12a-12b. Labor Problems.—I, II; (3).*Prerequisite:* Senior standing, Economics 1, and three additional hours in economics for which Economics 1 is a prerequisite. *Or:* Senior standing and Economics 1 for students whose major is one of the social sciences.

				FIRST SEMESTER							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	12a	3	—	2	—	2	—	2	—	206 Com.	Hoagland

SECOND SEMESTER			
Economics	12b	3	Schedule the same as for 12a (first semester).

13. Economic Development of Europe Since the Industrial Revolution.—II; (3).*Prerequisite:* Sixty hours of university work, including Economics 1 and 3. Students who present a statement from the department of history showing that they are taking history as a major, may be admitted without Economics 3.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Economics	13	3	—	10	—	10	—	10	—	206 Com.	Bogart

14. Agricultural Cooperation.—Open to junior and senior students of agriculture only. II; (2).*Prerequisite:* Economics 1 or 2.

Economics

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Economics	14	2	—	—	2	—	2	—	111 Com.	Stewart

15. Rural Credit.—Open to junior and senior students of agriculture only. I; (2).

Prerequisite: Economics 1 or 2.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Economics	15	2	—	—	2	—	2	—	206 Com.	Stewart

17. Economic History of Agriculture.—The development of agriculture in various countries at various times. Land tenure; large, medium, and small farms; economic conditions and results of extensive and intensive culture; organization in agriculture, and its relation to other industries and to the state. II; (2).

Prerequisite: Economics 1 or 2 and junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Economics	17	2	—	—	3	—	3	—	206 Com.	Thompson, J. G.

19. Economic History of the United States, 1820-1860.—I; (2).

Prerequisite: Open to graduates and seniors who have had Economics 1 and are taking a major in one of the social sciences.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Economics	19	2	—	—	10	—	10	—	101 Com.	Thompson, C. M.

20. Economic History of the United States Since 1860.—II; (2).

Prerequisite: Open to graduates and seniors who have had Economics 1 and are taking a major in one of the social sciences.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Economics	20	2	—	—	10	—	10	—	206 Com.	Thompson, C. M.

21. Socialism and Economic Reform.—II; (2).

Prerequisite: Economics 1 and 3. Students who have had 6 hours in history and Sociology 1 and present a statement from the department of sociology showing that they are taking sociology as a major may be admitted without Economics 3.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Economics	21	2	—	—	8	—	8	—	101 Com.	Kinley

28. Mechanism and Technic of Domestic Commerce.—Wholesale and retail trade organizations; markets, fairs, auctions, stock and produce exchanges; department, mail-order, and cooperative stores; commercial travelers; commercial competition; modern advertising; mercantile credit. I; (3).

Prerequisite: Economics 1 and 3.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Economics	28	3	Lecture	—	—	9	—	—	204 Com.	Litman
			A, Quiz	9	—	—	—	9	204 Com.	Litman
			B, Quiz	—	9	—	9	—	204 Com.	Litman

29. Foreign Commerce and Commercial Politics.—II; (2).

Prerequisite: Economics 28.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	29	2	—	—	11	—	11	—	—	204 Com.	Litman

31. Organization of Foreign Commerce.—Exporting and importing; ocean transportation; line and charter traffic; institutions for furthering export trade; the consular service; entry of goods; the work of the custom house. *II*; (3).

Prerequisite: Economics 28.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Economics	31	3	—	9	—	9	—	9	—	204 Com.	Litman

Courses for Graduates

Students entering on graduate work in economics must have a thoro course in the principles of the science and must also have studied some special part of the field, such as public finance or money and banking.

101. Economic Theory.—*Twice a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Economics	101	1 unit	—	—	9	—	9	—	—	206 Com.	Kinley

104. Foreign Commerce of the United States.—*Twice a week; I, II; (1 unit).*
Time to be arranged. Assistant Professor LITMAN

105. Public Finance.—The history and theory of public revenue and expenditure. *Twice a week; I, II; (1 unit).* *Time to be arranged.* Professor BOGART

107. The Corporation in Economic Evolution.—*Twice a week; I, II; (1 unit).*
Time to be arranged. Professor ROBINSON

[109. Theory of Industrial Consolidations.—*Twice a week; I, II; (1 unit).*
(Not given, 1917-18.)]

[110. Investments.—Nature, character, and functions of investments. Classes, including direct investments and securities of various types. Methods of judging investments. State control. *Twice a week; I, II; (1 unit).* (Not given, 1917-18.)]

118. Seminar.—*I, II. Time to be arranged.* Members of staff

120. History of Economic Thought.—*Twice a week; I, II; (1 unit).* *Time to be arranged.* Dr. J. G. THOMPSON

[122. Advanced Economic History of the United States.—*Twice a week; I, II; (1 unit).* (Not given, 1917-18.)]

EDUCATION

CHARLES HUGHES JOHNSTON, Ph.D., *Professor, Chairman*

HORACE ADELBERT HOLLISTER, A.M., *Professor*

GUY MONTROSE WHIPPLE,¹ Ph.D., *Professor*

WERRETT WALLACE CHARTERS, Ph.D., *Professor*

DAVID SPENCE HILL, Ph.D., *Acting Professor*

JOHN ALFORD STEVENSON, A.M., *Lecturer and Secretary*

JAMES MICHAEL O'GORMAN, A.M., *Lecturer*

HARRIETT JOSPHINE BERNINGER, A.M., *Assistant*

WARREN KENNETH LAYTON, A.B., *Assistant*

—Assistant

¹On leave of absence, first semester.

Education

Introductory Courses

1. Introduction to Education.—(a) The American public-school system; (b) the principles and aim of education; the biological basis, heredity, and environment; instinct, habit, and habit-formation; memory, and the higher mental processes. (This course is by Senate ruling required of all students who are given the official indorsement of the Appointments Committee for teaching positions in secondary schools.) *I* or *II*; (4).

Prerequisite: Junior standing. Psychology 1 is desirable.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	1	4	Lecture	—	1	—	1	—	—	100 Com.	{ Johnston Stevenson
			A	1	—	1	—	—	—	410 U. H.	{ Layton O'Gorman Berninger
			B	2	—	2	—	—	—	410 U. H.	
			C	—	3	—	3	—	—	410 U. H.	
			D	11	—	11	—	—	—	410 U. H.	
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			Lecture	—	1	—	1	—	—	100 Com.	{ Johnston Stevenson
			A	1	—	1	—	—	—	410 U. H.	{ Layton O'Gorman Berninger
			B	2	—	2	—	—	—	410 U. H.	
			D	11	—	11	—	—	—	410 U. H.	

2a-2b. History of Education.—First semester: history of the evolution of educational theory, institutions, and practise as related to the development of the Greek, Roman and medieval civilizations. Second semester: history of the evolution of educational theory, institutions, and practise as related to the development of civilizations since the Italian Renaissance. Particular emphasis will be placed on the development of state systems of education in the United States. *I, II*; (3). (Either semester may be taken separately.)

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	2a	3	—	8	—	8	—	8	—	218 L. H.	O'Gorman
	2b	3	—	8	—	8	—	8	—	218 L. H.	O'Gorman

Intermediate Courses

10. The Technic of Teaching.—Types of classroom exercises and preparation of teaching plans; the hygiene of instruction; classroom management; professional ethics. Observation of teaching in neighboring high schools. (This course with Education 1 is, by Senate ruling, required of all students who are given the official recommendation of the Appointments Committee for teaching positions in secondary schools.) *I* or *II*; (3).

Prerequisite: Education 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	10	3	A	1	—	1	—	1	—	202 L. H.	Charters
			B	2	—	2	—	2	—	202 L. H.	Charters
			C	3	—	3	—	3	—	202 L. H.	Charters
			A	1	—	1	—	1	—	202 L. H.	Charters
			B	2	—	2	—	2	—	202 L. H.	Charters
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			C	3	—	3	—	3	—	202 L. H.	Berninger
			D	11	—	11	—	11	—	202 L. H.	Charters

[16. Social Education.—I; (3) (Not given, 1917–18.)]

25. Educational Psychology.—(Introductory course.) Instinct; habit and the acquisition of skill; perception and memory; conception, judgment, and reasoning. Lectures; demonstrations. *I; (3).*

Prerequisite: Psychology 1 or Education 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	25	3	—	9	—	9	—	9	—	417 U. H.	Hill

Courses for Advanced Undergraduates and Graduates

4. Problems of Educational Administration.—The interpretation of present tendencies as exemplified in the school systems of typical cities and states, and in recent educational experiments in administration, discipline, and methods of teaching. *I; (3).*

Prerequisite: Education 1, 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	4	3	—	11	—	11	—	11	—	202 L. H.	Stevenson

5. Comparative Education.—Organization, administration, and basic national ideals of the school systems of the United States, Germany, England, and France, with reference to secondary education and to the training of teachers. *I; (3).*

Prerequisite: Education 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	5	3	—	9	—	9	—	9	—	113 L. H.	Hill

6. Principles of High-School Education.—The evolution of high schools and of the fundamental conceptions of secondary education; proposed reorganization; relation of high schools to the state systems; legal status; articulation with the elementary school, the college, the technical school, the community, and the home; the teaching staff; reconstruction of curriculums; "controls" of instruction; direction of "student activities." This course is planned for those who expect to teach in secondary schools. *I; (3).*

Prerequisite: Education 1 or its equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	6	3	—	10	—	10	—	10	—	113 L. H.	Johnston

27. High-School Curriculums.—Important historic curriculums for secondary education; modern curriculum-making; professional supervision; text-books, apparatus, and teaching devices; the psychology of high-school subjects; the constructing of curriculums for typical communities. *II; (3).*

Prerequisite: Education 1 or 6 (preferably both).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Education	27	3	—	10	—	10	—	10	—	113 L. H.	Johnston

13-14. Educational Classics.—The principal educational writings of Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Comenius, Rousseau, Pestalozzi, Froebel, and Herbert Spencer. (Ordinarily required for the Doctor's degree in education.) *I, II; (3).*

Prerequisite: Education 1, 2.

Education

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Education	13	3	—	3	—	3	—	3	—	103 L. H.

Instructor
O'Gorman

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Education	14	3	—	3	—	3	—	3	—	103 L. H.

Instructor
O'Gorman

15. School Hygiene.—The hygienic aspects of school architecture and equipment; the heating, ventilating, and lighting of school buildings; the hygiene of posture, exercise, and fatigue, and of reading and writing; the bearing of hygienic principles upon the program of studies and the daily time table; the mental health of teachers and pupils; communicable diseases and the relation of school authorities to health authorities. *II*; (2).

Prerequisite: Education 1, or normal-school graduation, or two years of teaching experience, with at least junior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Education	15	2	—	—	3	—	3	—	—	417 U. H.

Instructor
Whipple

18. Method in Educational Research.—Statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees.) *I*; (2).

Prerequisite: Education 1, or its equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Education	18	2	—	—	2	—	2	—	—	113 L. H.

Instructor
Hill

[19. Readings in French and German Educational Literature.—*I*; (2). *Time to be arranged.* (Not given, 1917-18.)

Prerequisite: Education 1, and moderate facility in reading French and German.]

[20a. Theory of Supervision.—The problems involved in the training of teachers in service; methods of measuring educational products; qualities of merit and causes of failure in teachers; selection of teachers; organization of teachers' meetings and other agencies for improving the teaching service. *I*; (3). (Not given, 1917-18.)

Prerequisite: Education 1, or its equivalent.]

41. Vocational Education.—The social significance of vocational education; institutions and methods of vocational education in elementary and secondary schools; federal, state, and municipal provisions; recent legislation; present tendencies. *I*; (3).

Prerequisite: Education 1, or an equivalent satisfactory to the instructor.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Education	41	3	—	—	2	—	2	—	—	117 L. H.

(1 hour arrange)

Instructor
Johnston
Layton

42. Auxiliary Education.—The institutions and methods for the training of defectives and delinquents; the Binet-Simon tests and other methods of mental diagnosis; educational treatment of morons and of moral delinquents; methods of teaching sensory defectives (the blind and the deaf); public institutions of auxiliary education and their administration. *II*; (2).

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	42	2	—	—	9	—	9	—	—	417 U. H.	Whipple

43. Mental Tests.—Laboratory drill in the technic of mental tests, including tests of sensory capacities; attention; memory; learning; suggestibility; inventiveness; systems of tests for diagnosis of mental age; general intellectual status; mental retardation. *II; (2).*

Prerequisite: Education 25 or an equivalent, and the consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	43	2	—	—	10,11	—	10,11	—	—	417 U. H.	Whipple

45. Problems in Educational Psychology.—*II; (2).*

Prerequisite: Education 25 and the consent of the instructor.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	45	2	—	—	—	—	—	—	—	(Arrange)	Whipple

Courses for Graduates

101. Seminar in Educational Theory.—The seminar in the fall of 1917 will consider the philosophical bases of educational theory. *I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	101	1 unit	—	—	7,8	—	—	—	—	103 L. H.	Johnston

106. Seminar in Secondary Education.—Organization, administration, and special methods of secondary education. Reports and discussions of technical investigations in the fields of high school administration and pedagogy. *II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	106	1 unit	—	—	—	—	4,5	—	—	103 L. H.	Johnston

110. Seminar in Methods of Teaching.—Individual investigation of problems of technic. *I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	110	1 unit	—	—	—	—	4,5	—	—	103 L. H.	Charters

[112. Principles of Education.—For graduate students who are not majoring in education and who have not taken undergraduate courses in education. The course involves: (a) survey of the American public-school system; (b) a statement of the leading principles and doctrines of educational science; and (c) a brief reference to the technic of teaching and the problems of class management. *Twice a week; II; (½ unit).* (Not given, 1917-18.)]

119. The Elementary Curriculum.—The functions and values of elementary-school studies; time allotments; practical exercises in the construction of curriculums. *II; (1 unit).*

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	119	1 unit	—	—	4,5	—	—	—	—	103 L. H.	Charters

125. Seminar in Educational Psychology.—The topic of the seminar for 1917-18 will be announced later. *I; (1 unit).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Education	125	1 unit	—	—	—	4,5	—	—	—	417 U. H.	Hill

Departmental Conference.—All graduate students majoring in education are expected to meet with the departmental staff every alternate Monday from 7 to 9 p. m. *I, II; (no credit).*

ELECTRICAL ENGINEERING

ELLERY BURTON PAINE, M.S., E.E., *Professor, Acting Head of the Department*

MORGAN BROOKS, Ph.B., M.E., *Professor*

EDWARD HARDENBERGH WALDO, A.B., M.S., M.E., *Assistant Professor*

PHILIP SHERIDAN BIEGLER, B.S., E.E., *Assistant Professor*

IRA WILLIAM FISK, M.S., E.E., *Assistant Professor*

LEONARD VAUGHAN JAMES, M.S., E.E., *Associate*

ABNER RICHARD KNIGHT, M.E., *Associate*

4. Elementary Electrical Engineering.—Electrical machinery; selection, installation, and operation; distribution of power; motor applications. *II*; (2).

Prerequisite: Physics 1a-1b, 3a-3b; junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	4	2	E U	—	1	—	1	—	—	207 E. L.	James
			O T	—	10	—	10	—	—	207 E. L.	

8. Electric Currents and Apparatus.—Direct and alternating current circuits and machines; storage batteries. (Especially for students in chemical engineering.) *I*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; registration or credit in Mathematics 7; registration in Electrical Engineering 68.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	8	3	Z	8	—	8	—	8	—	203 E. L.	—

11. Direct Current Apparatus.—Generators, motors, distribution circuits; storage batteries. (For students in mechanical engineering.) *I*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; Mathematics 8 or 9.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	11	3	P	8	—	8	—	8	—	207 E. L.	} Brooks
			Q	9	—	9	—	9	—	207 E. L.	

12. Alternating Current Apparatus.—Generators and motors, transformers, distribution systems. (For students in mechanical engineering.) *II*; (3).

Prerequisite: Electrical Engineering 11, 61.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	12	3	P	8	—	8	—	8	—	207 E. L.	} Brooks
			Q	1	—	1	—	1	—	207 E. L.	

25. Direct Current Apparatus.—Laws of electric and magnetic circuits; construction and operation of direct current generators and motors. *I*; (4).

Prerequisite: Registration in Electrical Engineering 75 and Physics 4a; Mathematics 9.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	25	4	L	11	11	—	11	11	—	206 E. L.	James Fisk Knight
			M	8	8	—	8	8	—	206 E. L.	
			N	9	9	9	9	—	—	206 E. L.	

26. Alternating Currents.—A mathematical and graphical treatment of the principles of periodic currents; theory of the simple phenomena in transmission lines and transformers. *II*; (4).

Prerequisite: Electrical Engineering 25; Physics 4a; registration in Electrical Engineering 76.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
E. E.	26	4	L	11	11	11	—	11	—	206 E. L.	James Fisk Knight
			M	8	8	8	8	—	—	206 E. L.	
			N	9	9	9	9	—	—	206 E. L.	

35. Alternating Current Apparatus.—Transformers and generators. *I*; (4).

Prerequisite: Electrical Engineering 26, 76.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
E. E.	35	4	L	9	—	9	9	9	—	205 E. L.	Paine James Knight Fisk
			M	9	—	9	9	9	—	203 E. L.	
			N	8	8	8	—	8	—	205 E. L.	

36. Alternating Current Apparatus.—Synchronous, induction, and commutator motors; rotary converters; distributed inductance and capacity; transient phenomena. *II*; (4).

Prerequisite: Electrical Engineering 35, 85.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
E. E.	36	4	L	9	—	9	9	9	—	207 E. L.	Paine James Fisk Knight
			M	9	9	9	9	—	—	203 E. L.	
			N	8	—	8	8	8	—	205 E. L.	

55. Electrical Design.—Electromagnets and dynamos, direct and alternating; transformers. *I*; (2).

Prerequisite: Electrical Engineering 26; registration in Electrical Engineering 35.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
E. E.	55	2	LMN	—	—	—	8	—	—	207 E. L.	Waldo Knight
			L	—	—	—	—	—	8-11	204 E. L.	
			M	—	8-11	—	—	—	—	204 E. L.	
			N ₁	—	1-4	—	—	—	—	204 E. L.	
			N ₂	—	—	—	—	1-4	—	204 E. L.	

56. Electrical Design.—Induction motors and converters; power plant design. Gebhardt: *Steam Power Plant Engineering*. *II*; (4).

Prerequisite: Electrical Engineering 35; Mechanical Engineering 2.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
E. E.	56	4	LMN	11	—	11	—	—	—	207 E. L.	Waldo Knight
			L	—	—	—	11	—	—	205 E. L.	
			M	—	—	—	—	9	—	205 E. L.	
			N	—	—	—	—	11	—	205 E. L.	
			L	—	—	—	—	—	8-11	204 E. L.	
			M	—	—	—	—	1-4	—	204 E. L.	
			N ₁	—	9-12	—	—	—	—	204 E. L.	
			N ₂	1-4	—	—	—	—	—	204 E. L.	

61. Direct Current Laboratory.—Circuits and machines. (For students in mechanical engineering.) *I*; (1).

Prerequisite: Registration in Electrical Engineering 11.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
E. E.	61	1	P	—	8-11	—	8-11	—	—	200 E. L.	}
			Q	—	2-5	—	2-5	—	—	200 E. L.	

62. Alternating Current Laboratory.—Alternating current circuits and machines. (For students in mechanical engineering.) *II*; (1).

Prerequisite: Electrical Engineering, 11, 16; registration in Electrical Engineering 12.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
E. E.	62	1	P Q	—	1-4	—	1-4	—	8-11	200 E. L.	—

64. Electrical Engineering Laboratory.—Testing of dynamos and motors. *II*; (1).

Prerequisite: Registration in Electrical Engineering 4.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
E. E.	64	1	E	—	—	1-4	—	—	—	200 E. L.	}
			O T	—	—	—	1-4	—	—	200 E. L.	
			U	—	9-12	—	—	—	—	200 E. L.	

68. Electrical Engineering Laboratory.—Direct and alternating current circuits and machines. *I*; (1).

Prerequisite: Registration in Electrical Engineering 8.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
E. E.	68	1	Z	1-4	—	—	—	1-4	—	200 E. L.	—

71-72. Electrical Engineering Laboratory.—The construction of special apparatus or other work approved by the department. (Elective for juniors and seniors.) *I, II*; (1 to 3).¹ *Time to be arranged.*

75. Electrical Engineering Laboratory.—Direct current laboratory accompanying Electrical Engineering 25. *I*; (2).

Prerequisite: Registration in Electrical Engineering 25.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
E. E.	75	2	LMN	—	10	—	—	—	—	207 E. L.	}
			L ₁	—	—	—	—	1-4	—	200 E. L.	
			L ₂	—	—	—	—	—	9-12	200 E. L.	
			M ₁	—	—	8-11	—	—	—	200 E. L.	
			M ₂	—	—	1-4	—	—	—	200 E. L.	
			N ₁	—	—	—	—	9-12	—	200 E. L.	

76. Electrical Engineering Laboratory.—Determination of the flux and E.M.F. waves of alternators. Alternating current circuits, instruments. *II*; (2).

Prerequisite: Electrical Engineering 25, 75; registration in Electrical Engineering 26.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
E. E.	76	2	LMN	—	—	—	11	—	—	206 E. L.	}
			L ₁	—	—	1-4	—	—	—	200 E. L.	
			L ₂	—	—	—	—	1-4	—	200 E. L.	
			M	—	—	9-12	—	—	—	200 E. L.	
			N ₁	—	—	—	—	8-11	—	200 E. L.	
			N ₂	1-4	—	—	—	—	—	200 E. L.	

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

85. Electrical Engineering Laboratory.—Advanced alternating current testing. *I*; (2).

Prerequisite: Electrical Engineering 76; registration in Electrical Engineering 35.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	85	2	LMN	—	11	—	—	—	—	207 E. L.	Biegler
			L	—	8-11	—	—	—	—	200 E. L.	
			M	—	—	1-4	—	—	—	200 E. L.	
			N ₁	—	—	—	9-12	—	—	200 E. L.	
			N ₂	1-4	—	—	—	—	—	200 E. L.	

86. Electrical Engineering Laboratory.—Advanced alternating current testing. *II*; (2).

Prerequisite: Electrical Engineering 85; registration in Electrical Engineering 36.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	86	2	LMN	—	8	—	—	—	—	207 E. L.	Biegler
			L	—	9-12	—	—	—	—	200 E. L.	
			M	1-4	—	—	—	—	—	200 E. L.	
			N ₁	—	—	—	9-12	—	—	200 E. L.	
			N ₂	—	—	—	—	1-4	—	200 E. L.	

90. Lighting.—Electric lamps and other illuminants, and their effective use; interior wiring; methods of distribution. (For students in architecture.) *I*, (half semester only); (1).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	90	1	—	—	8	—	8	—	—	P. Lect. B.	Brooks

92. Lighting and Wiring.—First half of semester same as E. E. 90. Further study of distribution and fusing. Underwriters' rules; motors. (For students in architectural engineering.) *I*; (2).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	92	2	—	—	8	—	8	—	—	P. Lect. B.	Brooks

95-96. Seminar.—Electrical railroading; illumination; telegraphy; telephony; storage batteries; electric metallurgy. *I, II*; (1).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
E. E.	95	1	LMN	—	—	—	1,2	—	—	206 E. L. 207 E. L.	Paine

E. E. 96 1 Schedule the same as for 95 (first semester).

98. Thesis.—First semester: preliminary reading and investigation; second semester: completion. *II*; (3). *Time to be arranged.*

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

Courses for Graduates

Entrance on graduate work in electrical engineering presupposes the full undergraduate course in that subject.

101. Advanced Course in Alternating Currents.—The theory of Transient Phenomena; polyphase circuits; measuring apparatus. *Twice a week; I, II; (1½ units).* *Time to be arranged.* Professor PAINE

103. Electrical Design.—Plans for an electrical machine or apparatus of specified character; or for the arrangement of an electrical plant; or for the installation of such machinery or apparatus. *Twice a week; II; (1 unit).* *Time to be arranged.* Assistant Professor WALDO

104. Telegraphy and Telephony.—*Once a week; I, II; (1 unit).* *Time to be arranged.* Professor BROOKS

105. Electrical Engineering Research.—Investigation of electrical phenomena, or tests of some electrical machine, or of a plant of such machines. *Twice a week; I, II; (1 to 3 units).* *Time to be arranged.* Professor PAINE

106. Illumination.—*Once a week; I, II; (1 unit)* *Time to be arranged.* Professor BROOKS

ENGINEERING

(See ARCHITECTURE, CERAMIC ENGINEERING, CIVIL ENGINEERING, DRAWING, ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING, MECHANICS, MINING ENGINEERING, MUNICIPAL AND SANITARY ENGINEERING, PHYSICS, RAILWAY CIVIL ENGINEERING, RAILWAY ELECTRICAL ENGINEERING, and RAILWAY MECHANICAL ENGINEERING)

THE ENGLISH LANGUAGE AND LITERATURE

(Including CELTIC, RHETORIC, JOURNALISM, and PUBLIC SPEAKING)

STUART PRATT SHERMAN, Ph.D., *Professor, Chairman*

DANIEL KILHAM DODGE, Ph.D., *Professor*

THOMAS ARKLE CLARK, B.L., *Professor*

ERNEST BERNBAUM, Ph.D., *Professor*

EDWARD FULTON,¹ Ph.D., *Associate Professor*

HARRY GILBERT PAUL, Ph.D., *Associate Professor*

EDWARD CHAUNCEY BALDWIN, Ph.D., *Assistant Professor*

FRANKLIN WILLIAM SCOTT, Ph.D., *Assistant Professor, Secretary*

HARRIE STUART VEDDER JONES, Ph.D., *Assistant Professor*

JACOB ZEITLIN, Ph.D., *Assistant Professor*

HERBERT LESOURD CREEK, Ph.D., *Associate*

CLARENCE VALENTINE BOYER, Ph.D., *Associate*

GERTRUDE SCHOEPFERLE, Ph.D., *Associate*

HARRY FRANKLIN HARRINGTON, A.M., *Associate*

HAROLD N HILLEBRAND, Ph.D., *Associate*

HARRISON MCJOHNSTON, A.M., *Associate*

MARTHA JACKSON KYLE, A.M., *Instructor*

CLARISSA RINAKER, Ph.D., *Instructor*

EASLEY STEPHEN JONES, A.M., *Instructor*

MERVIN JAMES CURL, A.M., *Instructor*

ROGER SHERMAN LOOMIS, B.Litt., A.M., *Instructor*

¹ On leave of absence.

ROBERT CALVIN WHITFORD, A.M., *Instructor*
 ALLENE GREGORY, Ph.D., *Instructor*
 SIGURD OSBORN HUSTEVDT, Ph.D., *Instructor*
 ROBERT BRUCE WEIRICK, A.M., *Instructor*
 HARRY TORSEY BAKER, A.M., *Instructor*
 LEW R SARETT, A.B., *Instructor*
 HAMILTON JEWETT SMITH, Ph.D., *Instructor*
 JOHN J PARRY, Ph.D., *Instructor*
 EMERSON GRANT SUTCLIFFE, A.M., *Instructor*
 _____, *Instructor*
 SADA ANNIS HARBARGER, A.M., *Assistant*
 RUTH KELSO, A.M., *Assistant*
 LEWIS IGNATIUS BREDVOLD, A.M., *Assistant*
 JAMES MANLEY PHELPS, A.B., *Assistant*
 BEATRICE VIRGINIA COPLEY, A.B., *Assistant*
 FREDERICK IRVIN MYERS, A.M., *Assistant*
 CHESTER CLYDE HARBISON, A.B., *Assistant*
 GERALD DARFIELD STOPP, A.B., *Assistant*
 _____, *Assistant*

Major: 20 hours in English excluding Rhetoric 1-2 and English 10, and including at least 10 hours in English literature, at least 3 hours in composition, and at least 1 one-year course, or its equivalent, from the advanced group of courses.

Minor: 20 hours in either (a) one foreign language; or (b) in any two foreign languages; or (c) in one foreign language and philosophy; or (d) in one foreign language and history.

A. ENGLISH LITERATURE AND LANGUAGE

Elementary Courses

1-2. Survey of English Literature.—(Credit is not given for either semester separately, nor for the course in addition to course 10-11 or course 20.) *I, II; (4).*

Prerequisite: One year of college work.

NOTE.—Registration for lecture and discussion sections on the same day is not permitted.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	1	4	1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	Sherman
			A Discussion	8	—	8	—	—	—	302 U. H.	Hillebrand
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ₁ Discussion	2	—	2	—	—	—	307 U. H.	Hillebrand
			F ₂ Discussion	2	—	2	—	—	—	314 U. H.	Rinaker
			K Discussion	—	8	—	8	—	—	307 U. H.	Creek
			N ₁ Discussion	—	11	—	11	—	—	308 U. H.	Baldwin
			N ₂ Discussion	—	11	—	11	—	—	314 U. H.	Schoepperle
			O Discussion	—	1	—	1	—	—	307 U. H.	Fulton

The English Language and Literature

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	2		4 1 Lecture	11	—	11	—	—	—	418 U. H.	Baldwin
			2 Lecture	—	2	—	2	—	—	410 U. H.	Sherman
			A Discussion	8	—	8	—	—	—	302 U. H.	Hillebrand
			E Discussion	1	—	1	—	—	—	302 U. H.	Rinaker
			F ₁ Discussion	2	—	2	—	—	—	314 U. H.	Rinaker
			F ₂ Discussion	2	—	2	—	—	—	308 U. H.	Hustvedt
			K Discussion	—	8	—	8	—	—	307 U. H.	Hillebrand
			N ₁ Discussion	—	11	—	11	—	—	314 U. H.	Baldwin
			N ₂ Discussion	—	11	—	11	—	—	302 U. H.	Schoepperle
			O Discussion	—	1	—	1	—	—	307 U. H.	Hustvedt

10-11. Introduction to Literature.—First Semester: the Forms of Poetry. Second semester: the Forms of Prose Literature. (This course is intended only for those who expect to include a considerable amount of literature, in English or in some other language, in their curriculum. Credit is not given for the course in addition to English 1-2 or 20 nor for the first semester separately. One semester's work is credited toward a major in English.) *I, II; (3).*

Prerequisite: The minimum entrance requirements in English.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	10	3	A	8	—	8	—	8	—	315 U. H.	Paul
			B	9	—	9	—	9	—	302 U. H.	Zeitlin
			C	10	—	10	—	10	—	302 U. H.	Dodge
			D	11	—	11	—	11	—	318 U. H.	Baker
SECOND SEMESTER											
English	11	3	A	8	—	8	—	8	—	214 U. H.	Loomis
			B	9	—	9	—	9	—	302 U. H.	Zeitlin
			C	10	—	10	—	10	—	302 U. H.	Dodge
			D	11	—	11	—	11	—	214 U. H.	Jones, H.S.V.

12-13. American Literature.—(Credit is not given for either semester separately.) *I, II; (2).*

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
English	12	2	—	—	1	—	1	—	—	418 U. H.	Paul
SECOND SEMESTER											
English	13	2	Schedule the same as for 12 (first semester).								

17. The English Language.—History, characteristics, and usage of modern English. *I; (3).*

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	17	3	—	2	—	2	—	2	—	117 L. H.	—

20. Chief English Writers.—For those whose program admits of but one semester's work in English, and who therefore may not register for English 1. It is not accepted as a prerequisite for more advanced courses. Credit is not given for the course in addition to English 1 or 10. *I or II; (4).*

Prerequisite: One year of college work.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	20	4	B	9	9	9	9	—	—	315 U. H.	—
			C	10	10	10	10	—	—	418 U. H.	Loomis
			D	11	11	11	11	—	—	315 U. H.	Jones, E. S.
			E	1	1	1	1	—	—	315 U. H.	Boyer
			G	3	3	3	3	—	—	214 U. H.	Hustvedt

SECOND SEMESTER									
B	9	9	9	9	—	—	315 U. H.	Baker	
D	11	11	11	11	—	—	— U. H.	Jones, E. S.	
E	1	1	1	1	—	—	315 U. H.	Boyer	
G	3	3	3	3	—	—	214 U. H.	Whitford	

23. Introduction to Shakespeare.—I or II; (3).

Prerequisite: English 1-2 or 10-11.

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	23	3	—	2	—	2	—	2	—
								315 U. H.	Sherman
SECOND SEMESTER									
				2	—	2	—	2	—
								315 U. H.	Hillebrand

Intermediate Courses

Prerequisite: Eleven hours of English literature, or eight hours of English literature and eight hours of a foreign language.

21-22. Literary Study of the Bible.—Hebrew literature as an expression of the life of the race that produced it; the debt, both ethical and artistic, of modern life to ancient Hebrew thought. (Either semester may be taken separately.) *I, II; (3).*

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	21	3	—	10	—	10	—	10	—
								307 U. H.	Baldwin
SECOND SEMESTER									
English	22	3		Schedule the same as for 21 (first semester).					

24. English Literature of the Victorian Period.—II; (3).

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	24	3	—	11	—	11	—	11	—
								308 U. H.	Kyle

29. English Literature From 1557 to 1688, Exclusive of the Drama.—I; (3).

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	29	3	—	—	10	—	10	—	—
								307 U. H.	Baldwin

31. English Literature From 1688 to 1789.—II; (3).

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	31	3	—	—	8	—	8	—	—
								110 L. H.	Paul

33. English Literature From 1789 to 1837.—I; (3).

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	33	3	—	11	—	11	—	11	—
								307 U. H.	Zeitlin

43. Browning.—Intensive reading of the principal poems. *I; (3).*

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	43	3	—	11	—	11	—	11	—
								—	Kyle

Courses for Advanced Undergraduates and Graduates

Prerequisite: Sixteen hours of English literature; or junior or senior standing and the approval of the instructor concerned.

3. The Poetry of Milton.—Origins, forms, artistic and ethical values; Milton's place in English literary history. *II; (3).*

The English Language and Literature

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	3	3	—	—	10	—	10	—	—	110 L. H.	Baldwin

4. **English Versification.**—History and technic; reading of representative poems; verse composition conferences. *I*; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	4	2	—	—	10	—	10	—	—	110 L. H.	Creek

5. **Shakespeare.**—Intensive study of six plays, with special emphasis on *Hamlet*. II; (3).

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
English	5	3	—	9	—	9	—	9	—	110 L. H.	Dodge

25. Chaucer.—*I*; (3).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	25	3	—	10	—	10	—	10	—	218 L. H.	Jones, H.S.V.

8-9. Old English (Anglo-Saxon).—Grammar; short poems; *Beowulf*. (The first semester may be taken separately.) *I, II*; (3).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	8	3	—	11	—	11	—	11	—	110 L. H.	Dodge

SECOND SEMESTER		
English	9	3
Schedule the same as for 8 (first semester).		

27. **English Essay Periodicals.**—The genesis and evolution of the periodical essay in the seventeenth and eighteenth centuries. *I*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	27	2	—	—	2	—	2	—	—	218 L. H.	Scott

28. The Magazine in America.—*II*; (2).

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
English	28	2	—	—	2	—	2	—	—	218 L. H.	Scott

41. The Teaching of English Literature.—*I*; (2).

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
English	41	2	—	—	3	—	3	—	—	110 L. H.	Paul

42. The Teaching of English Composition.—II; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
English	42	2	—	—	3	—	3	—	—	110 L. H.	Paul

16. **Development of English Prose.**—Theory and practise of prose style from the year 1500 onward, with special reference to classical and French influences. II; (3).

Prerequisite: Credit for either entrance or College Latin or French.

				SECOND SEMESTER							
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
English	16	3	—	11	—	11	—	11	—	218 L. H.	Zeitlin

35-36. The English Drama (Exclusive of Shakespeare).—First Semester: from the beginning to 1600. Second semester: from 1600 to 1700. (Either semester may be taken for separate credit.) *I, II; (3).*

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	35	3	—	9	—	9	—	9	—
								Room	Instructor
								110 L. H.	Dodge

SECOND SEMESTER									
English	36	3	—	3	—	3	—	3	—
								Room	Instructor
								110 L. H.	Hillebrand

37. Folk-Lore.—Primitive customs and beliefs surviving in English poetry. Folk lyric and drama. Early satire and gnomic literature. *I; (2).*

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	37	2	—	—	10	—	10	—	—
								Room	Instructor
								320 L. H.	Schoepperle

38. The Arthurian Tradition in England.—The historical Arthur. Celtic tales. Old French Romances (in translation). The tradition in England from the early romances to Arnold, with special attention to Malory and Tennyson. *II; (2).*

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	38	2	—	—	10	—	10	—	—
								Room	Instructor
								— L. H.	Schoepperle

39. Introduction to the Literature of the Middle Ages.—Classical influences. Principal types: epic, romance, legend, lay, allegory, fabliau, lyric. Important poems, both English and continental, will be read in translation. *II; (3).*

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	39	3	—	3	—	3	—	3	—
								Room	Instructor
								— L. H.	Creek

45. The Development of the Modern Drama.—Dramatic tendencies in the nineteenth century, both in England and on the Continent; representative readings, and lectures from the standpoint of comparative literature. *I; (3).*

FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	45	3	—	3	—	3	—	3	—
								Room	Instructor
								110 L. H.	Hillebrand

52. The Great Novelists of the Nineteenth Century.—Scott, Jane Austen, Dickens, Thackeray, Hawthorne, George Eliot, Meredith, Hardy, Stevenson, etc. *II; (3).*

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	52	3	—	11	—	11	—	11	—
								Room	Instructor
								320 L. H.	Bernbaum

53. Matthew Arnold.—A study of his prose and poetry with special reference to the main currents of nineteenth century thought. *II; (3).*

SECOND SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S
English	53	3	—	2	—	2	—	2	—
								Room	Instructor
								—	Sherman

60a-60b. Thesis.—Special training in investigation for candidates for honors and for other seniors. *I, II; (1). Time to be arranged.*

Assistant Professor ZEITLIN, Dr. HILLEBRAND, and others

Courses for Graduates

101. Research in Special Topics.—Guidance in writing theses for advanced degrees. *I, II; (1 or 2 units.)* Professor SHERMAN, Professor DODGE, Professor BERNBAUM, Associate Professor FULTON, Associate Professor PAUL, Assistant Professor BALDWIN, Assistant Professor SCOTT, Assistant Professor JONES, Assistant Professor ZEITLIN.

110. Old English (Anglo-Saxon) Poetry.—*Twice a week. I; (1 unit).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	110	1 unit	—	(Arrange)						110 L. H.	Dodge

112. The History of the English Language.—*I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
English	112	1 unit	—	—	9	—	9	—	—	218 L. H.	Zeitlin

126. Ballads.—Studies in the relation of folk poetry to literature. *I; (1 unit).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	126	1 unit	—	(Arrange).						—	Schoepperle

127. Metrical Romances.—The beginnings of verse fiction. *II; (1 unit).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
English	127	2	—	—	2	—	2	—	—	—	Schoepperle

129. English Literature from the Norman Conquest to Chaucer.—Readings in Middle English authors exclusive of Chaucer and lectures on the literature of the period. *I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
English	129	1 unit	—	—	9	—	9	—	—	110 L. H.	Jones, H.S.V.

136. The Transition from the Seventeenth to the Eighteenth Century, 1675-1725; the Rise of Classicism.—*Twice a week. I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
English	136	1 unit	—	—	2	—	2	—	—	110 L. H.	Paul

137. Nineteenth Century Prose Writers.—The relation of literature to social forces; the works of Mill, Carlyle, Newman, Ruskin, Arnold, and Pater. *Twice a week. I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
English	137	1 unit	—	—	3	—	3	—	—	218 L. H.	Sherman

140. Investigation in Modern English Literature.—For second and third year graduate students who are preparing theses for the doctor's degree. May be taken in successive years. *Three hours, once a week; I, II; (1 to 3 units).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
English	140	1 to 3 units	—	(Arrange).						—	Bernbaum

141. The History of Seventeenth Century English Literature to about the year 1675, beginning with Shakespeare's Sonnets.—*I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
English	141	1 unit	—	—	2	—	2	—	—	—	Bernbaum

The English Language and Literature

(The following sections are open only to engineering students.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	A 4	8	—	8	—	8	—	403 P. L.	Sutcliffe
			A 5	8	—	8	—	8	—	513 U. H.	Harbarger
			B 4	9	—	9	—	9	—	204 T. B.	Sutcliffe
			D 4	11	—	11	—	11	—	202 E. H.	Harbarger
			E 4	1	—	1	—	1	—	318 U. H.	Myers
			E 5	1	—	1	—	1	—	205 E. H.	Parry
			F 4	2	—	2	—	2	—	202 E. H.	Whitford
			F 5	2	—	2	—	2	—	205 E. H.	Myers
			G 4	3	—	3	—	3	—	202 E. H.	Bredvold
			G 5	3	—	3	—	3	—	—	—
			K 4	—	8	—	8	—	8	205 E. H.	Bredvold
			K 5	—	8	—	8	—	8	302 U. H.	Hustvedt

(The following sections are open only to men students in the College of Agriculture.)

A 8	8	—	8	—	8	—	105 Law	Kelso
A 9	8	—	8	—	8	—	311 U. H.	Gregory
A 10	8	—	8	—	8	—	420 U. H.	Smith
C 8	10	—	10	—	10	—	207 E. L.	—
C 9	10	—	10	—	10	—	420 U. H.	Kelso
C 10	10	—	10	—	10	—	318 U. H.	Bredvold
C 11	10	—	10	—	10	—	512 U. H.	—
D 8	11	—	11	—	11	—	102 E. H.	—
L 8	—	9	—	9	—	9	302 U. H.	Weirick
L 9	—	9	—	9	—	9	308 U. H.	Rinaker
L 10	—	9	—	9	—	9	314 U. H.	Loomis

(Section Z1 below is for foreign students not versed sufficiently in English to pursue the course in regular sections. Students must obtain permission of Dr. Creek before registering in this section.)

Z 1	4	—	4	—	4	—	420 U. H.	Creek
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(The following sections of Rhetoric 1 (first semester Rhetoric) will be given during the second semester.)

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	1	3	B 1	9	—	9	—	9	—	—	—
			C 1	10	—	10	—	10	—	418 U. H.	—
			D 1	11	—	11	—	11	—	318 U. H.	Kelso
			E 1	1	—	1	—	1	—	307 U. H.	—
			K 1	—	8	—	8	—	8	419 U. H.	Sutcliffe
			L 1	—	9	—	9	—	9	420 U. H.	Smith
			M 1	—	10	—	10	—	10	419 U. H.	Smith

2. Rhetoric and Themes.—(Continuation of Rhetoric 1.) Required for students in the Colleges of Liberal Arts and Sciences, Commerce, Engineering, and Agriculture.

Prerequisite: Rhetoric 1.

(The following sections of Rhetoric 2 (second semester Rhetoric) will be given during the first semester, and are open to students of all colleges who can fulfill the prerequisite.)

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	A 1	8	—	8	—	8	—	—	—
			B 1	9	—	9	—	9	—	308 U. H.	Weirick
			B 2	9	—	9	—	9	—	249 N. H.	Harbarger
			C 1	10	—	10	—	10	—	214 U. H.	—
			D 1	11	—	11	—	11	—	308 U. H.	Kelso
			E 1	1	—	1	—	1	—	208 P. L.	Smith
			F 1	1	—	1	—	1	—	—	—
			N 1	—	11	—	11	—	11	307 U. H.	Sutcliffe

The English Language and Literature

SECOND SEMESTER

(The following sections are open only to students of the Colleges of Liberal Arts and Sciences, Commerce, and Law, the School of Music, and women students of the College of Agriculture.)

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	2	3	A 1	8	—	8	—	8	—	419 U. H.	—
			A 2	8	—	8	—	8	—	314 U. H.	Hustvedt
			A 3	8	—	8	—	8	—	307 U. H.	Baker
			B 1	9	—	9	—	9	—	307 U. H.	Jones, H.S.V.
			B 2	9	—	9	—	9	—	318 U. H.	Curl
			B 3	9	—	9	—	9	—	314 U. H.	Gregory
			B 7	9	—	9	—	9	—	— U. H.	Loomis
			B 8	9	—	9	—	9	—	—	—
			C 1	10	—	10	—	10	—	419 U. H.	Gregory
			C 2	10	—	10	—	10	—	314 U. H.	Rinaker
			C 3	10	—	10	—	10	—	315 U. H.	Myers
			C 4	10	—	10	—	10	—	—	Kyle
			C 5	10	—	10	—	10	—	—	Baker
			D 1	11	—	11	—	11	—	420 U. H.	Weirick
			D 2	11	—	11	—	11	—	307 U. H.	—
			D 3	11	—	11	—	11	—	314 U. H.	Whitford
			D 6	11	—	11	—	11	—	302 U. H.	—
			D 7	11	—	11	—	11	—	315 U. H.	Loomis
			E 1	1	—	1	—	1	—	308 U. H.	Weirick
			E 2	1	—	1	—	1	—	314 U. H.	Harbison
			E 3	1	—	1	—	1	—	214 U. H.	Baker
			E 6	1	—	1	—	1	—	420 U. H.	Parry
			F 1	2	—	2	—	2	—	419 U. H.	Parry
			F 2	2	—	2	—	2	—	420 U. H.	Myers
			G 1	3	—	3	—	3	—	308 U. H.	—
			G 2	3	—	3	—	3	—	—	Boyer
			K 1	—	8	—	8	—	8	308 U. H.	—

(The following sections are open only to students in the College of Engineering.)

A 4	8	—	8	—	8	—	208 P. L.	Myers
B 4	9	—	9	—	9	—	205 E. H.	Sutcliffe
B 5	9	—	9	—	9	—	204 T. B.	Bredvold
B 6	9	—	9	—	9	—	—	Harbarger
D 4	11	—	11	—	11	—	204 T. B.	Harbarger
E 4	1	—	1	—	1	—	202 E. H.	Myers
E 5	1	—	1	—	1	—	308 E. H.	Bredvold
F 4	2	—	2	—	2	—	202 E. H.	Whitford
F 5	2	—	2	—	2	—	308 E. H.	Bredvold
K 4	—	8	—	8	—	8	302 P. L.	Hustvedt
L 4	—	9	—	9	—	9	205 E. H.	Sutcliffe

(The following sections are open only to men students in the College of Agriculture.)

A 8	8	—	8	—	8	—	418 U. H.	Kelso
A 9	8	—	8	—	8	—	315 U. H.	—
A 10	8	—	8	—	8	—	420 U. H.	—
C 8	10	—	10	—	10	—	513 U. H.	—
C 9	10	—	10	—	10	—	420 U. H.	Kelso
C 10	10	—	10	—	10	—	318 U. H.	Smith
C 11	10	—	10	—	10	—	512 U. H.	—
D 8	11	—	11	—	11	—	—	Parry
N 8	—	11	—	11	—	11	—	Rinaker
N 9	—	11	—	11	—	11	—	Gregory

(Section Z below is for foreigners. Students must obtain the permission of Dr. Creek before registering in this section.)

Z	4	—	4	—	4	—	420 U. H.	Creek
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Intermediate Courses

3a.¹ Exposition.—Themes or topics of general interest; analyses of facts and ideas, literary reviews, and criticisms; informal essays. *I* or *II*; (3).

Prerequisite: Rhetoric 1-2.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Rhetoric	3a	3	—	9	—	9	—	9	—	202 L. H. Jones, E. S.

SECOND SEMESTER							
A 1	8	—	8	—	8	—	Kyle
B 2	9	—	9	—	9	—	Jones, E. S.

3b.¹ Exposition.—Themes on topics of especial interest to students in engineering, agriculture, science, and commerce. *I*; (3).

Prerequisite: Rhetoric 1-2.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Rhetoric	3b	3	—	8	—	8	—	8	—	104 P. L. Curl

3c.¹ Argument.—Wide reading on both sides of current questions; writing of briefs and of three long arguments. *I*; (3).

Prerequisite: Rhetoric 1-2.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Rhetoric	3c	3	—	9	—	9	—	9	—	308 L. H. Loomis

3d.¹ Description and Simple Narrative.—*II*; (3).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Rhetoric	3d	3	—	10	—	10	—	10	—	—	Curl

6-7. Narrative Composition.—Practise in short story writing. (Intended for those who have some aptitude for literary work.) *I, II*; (3).

Prerequisite: Two years of college work and the consent of the instructor.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Rhetoric	6	3	—	3	—	3	—	3	—	117 L. H. Curl

Rhetoric 7 3 — Schedule the same as for 6 (first semester).

10. Business Writing.—Correspondence; sales letters; practise in writing business reports and summaries. Lectures and discussions. (Not counted toward a major in English.) *I* or *II*; (2).

Prerequisite: Rhetoric 1-2.

NOTE.—Sections B₁, C₁, D₁, and D₄, in the first semester, and D₁, in the second, are for students in the College of Commerce and Business Administration.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Rhetoric	10	2	B 1	—	9	—	9	—	—	312 Com. McJohnston
			B 2	—	9	—	9	—	—	105 Law Warnock
		1	C 1	10	—	10	—	—	—	312 Com. McJohnston
			C 2	—	10	—	10	—	—	104 P. L. Harbarger
		1	D 1	11	—	11	—	—	—	308 Com. McJohnston
			D 2	—	11	—	11	—	—	302 U. H. Creek
		4	D 3	—	11	—	11	—	—	105 Law Thurber
			D 4	—	11	—	11	—	—	308 Com. McJohnston

¹ No more than 6 hours' credit may be earned in Rhetoric 3; to obtain 6 hours, two different types of composition must be elected.

The English Language and Literature

SECOND SEMESTER									
B	—	9	—	9	—	—	105 Law	Warnock	
C 1	—	10	—	10	—	—	312 Com.	Harbarger	
C 2	—	10	—	10	—	—	315 U. H.	—	
D 1	11	—	11	—	—	—	308 Com.	McJohnston	
D 2	—	11	—	11	—	—	307 U. H.	Creek	
D 3	—	11	—	11	—	—	— U. H.	—	

22. Summarizing and Briefing.—Summarizing, briefing, and making reports; abstracts of correspondence on file; summarizing of commercial and economic data for the solution of business problems. (For students in the College of Commerce and Business Administration.) *II*; (2).

Prerequisite: Rhetoric 10.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	22	2	A	—	9	—	9	—	—	312 Com.	McJohnston
			B	10	—	10	—	—	—	308 Com.	McJohnston
			C	—	11	—	11	—	—	308 Com.	McJohnston

Courses for Advanced Undergraduates and Graduates

15-16. Editorials and Special Articles.—Sources and treatment of material for editorials and articles; the interpretation of news; journalistic backgrounds; the relation of current events to the social sciences. Assigned readings; preparation of editorials, feature articles, and reviews. *I, II*; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	15	3	—	2	—	2	—	2	—	211 U. H.	Scott

Rhetoric 16 3
SECOND SEMESTER
Schedule the same as for 15 (first semester).

17. Advanced Composition.—The study of structure; criticism of current periodical literature; development of material for reports and magazine articles. (Open to a limited number of students, and only on recommendation.) *II*; (3).

Prerequisite: Two years of college work.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Rhetoric	17	3	—	10	—	10	—	10	—	— U. H.	Weirick

D. JOURNALISM

1. The Collecting and Writing of News.—Drill in gathering news; exercises and assignments in writing the news-story; the various types of newspaper narratives; news values considered with the aid of representative newspapers on file in the laboratory. *I*; (3).

Prerequisite: Rhetoric 1-2.

FIRST SEMESTER											
Subject	No. Credits		Section	M	T	W	T	F	S	Room	Instructor
Journalism	1	3	A	9	—	9	—	9	—	— U. H.	Harrington
			B	1	—	1	—	1	—	— U. H.	Harrington

2. The Newspaper.—(A continuation of Journalism 1.) Interviewing and newspaper correspondence; the organization and mechanical details of the newspaper. Syndicates, bureaus, press associations. Practise in writing for newspapers. *Six laboratory periods and three lectures a week.* *II*; (3).

Prerequisite: Rhetoric 1-2; Journalism 1.

The English Language and Literature

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Journalism	2	3	A	9	—	9	—	9	—	— U. H.	Harrington
			B	1	—	1	—	1	—	— U. H.	Harrington

3-4. Editorial Practise.—Practical training in the reading of "copy," building of headlines, rewriting, making up, editorial supervision, proof reading, and type selection. *Five hours' work on the desk and one lecture a week. I, II; (3).*

Prerequisite: Journalism 1 and 2, or the consent of the instructor.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Journalism	3	3	—	3	3	3	3	3	—	— U. H.	Harrington

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Journalism	4	3	—	Schedule the same as for 3 (first semester).					U. H.	Harrington

5. Newspaper Problems and Policies.—The relation of the newspaper to the public. Ethical aspects in the treatment of news, display, editorials, and advertising. *I; (2).*

Prerequisite: One course in journalism.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Journalism	5	2	—	—	10	—	10	—	U. H.	Harrington

6. Making a Country Newspaper.—Discussions intended primarily for juniors and seniors interested in the publication of country weeklies and small city dailies. A study of small town conditions; problems affecting rural newsgathering; country correspondence; circulation; advertising; business efficiency; print-shop equipment. Special investigations by members of the class. *II; (2).*

Prerequisite: Junior or senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Journalism	6	2	—	—	10	—	10	—	U. H.	Harrington

8. Agricultural News Writing.—Class exercises; lectures; assignments in gathering and preparing material for agricultural and country papers. *II; (3).*

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Journalism	8	3	—	—	3	—	3	—	302 U. H.	Scott

9-10. Editorials and Special Articles.—(See Rhetoric 15-16.)

20. English Literary Periodicals.—(See English 27.)

21. The Magazine in America.—(See English 28.)

See also Business Organization and Operation 10 (Organization and Operation of Newspaper Publishing).

E. PUBLIC SPEAKING

1. Oral Expression.—Theory and practise of oral expression for public and private address; elimination of mannerisms; cultivation of vocal purity and power; development of self-confidence and poise. *I; (2).*

NOTE: Credit is not given for this course unless it is followed by Public Speaking 2 or 10.

Prerequisite: Rhetoric 1-2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Public Speaking	1	2	A	1	—	1	—	—	—	—	Stopp
			B	—	1	—	1	—	—	—	Phelps
			C	2	—	2	—	—	—	—	Stopp
			D	—	2	—	2	—	—	—	Phelps
			E	3	—	3	—	—	—	—	Phelps
			F	—	3	—	3	—	—	—	Phelps
			G	—	9	—	9	—	—	—	Stopp
			H ¹	—	1	—	1	—	—	—	Harbison
			I	—	10	—	10	—	—	—	Harbison
			J	11	—	11	—	—	—	—	Harbison
			K	—	11	—	11	—	—	—	Stopp
			L	1	—	1	—	—	—	—	Phelps

2. Extemporaneous Speaking.—Theory and practise in coherent and effective organization of original materials, and in composition for practical public speaking; adaptation of speaking manner to subject matter; discussion of topics of current interest. *II*; (2).

Prerequisite: Public Speaking 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Public Speaking	2	2	B	—	1	—	1	—	—	—	Stopp
			C	2	—	2	—	—	—	—	Phelps
			D	—	2	—	2	—	—	—	Harbison
			E	—	3	—	3	—	—	—	Stopp
			F	—	9	—	9	—	—	—	Stopp
			G	—	10	—	10	—	—	—	Harbison
			H ¹	—	1	—	1	—	—	—	Harbison
			I	11	—	11	—	—	—	—	Stopp
Public Speaking	2	2	J	—	11	—	11	—	—	—	Stopp

3. Argumentation.—Theory of argumentative discourse, for the cultivation of ability in meeting the contentions of an opponent, in analytical and instructive thinking; briefing, speech-writing, training in detection of fallacies in popular argument, criticism of the literature of debate; text and exercises. *I*; (3).

Prerequisite: Public Speaking 1 and 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Public Speaking	3	3	—	2	—	2	—	2	—	320 U. H.	Sarett

4. Debate.—Application of the principles of argumentation to spoken debate, particularly political and intercollegiate discussions; team competition, adaptation of argument to various types of audience; popular debate; opportunities for practise debates before real audiences. *II*; (3).

Prerequisite: Public Speaking 3.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Public Speaking	4	3	—	2	—	2	—	2	—	320 U. H.	Sarett

5. Persuasion.—The winning of individuals and audiences by means of the written and spoken appeal; a study of the psychological sources of human action; primarily a study in matter, with secondary attention to appropriate platform manner and methods. *I*; (2).

Prerequisite: Public Speaking 1 and 2.

¹ The work in Section H will be adapted to the special needs of the pre-legal students.

Entomology

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Public	5	2	A	—	2	—	2	—	312 U. H.	Sarett
Speaking			B	3	—	3	—	—	312 U. H.	Sarett

6. Forms of Public Address.—Application of the principles of persuasion to particular types of address; practise in the composition and delivery of legislative, political, commemorative, dedicatory, inaugural, and academic addresses; the sales talk, plea for a client, the college oration, commencement address, lyceum lecture, and after-dinner talk. *II*; (2).

Prerequisite: Public Speaking 1 and 2. Public Speaking 5 is recommended.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Public	6	2	A	—	2	—	2	—	312 U. H.	Sarett
Speaking										

7. A Study of Orators and Oratory.—The lives, times, and works of distinguished speakers. Required readings and reports, chiefly oral in the form of speeches; discussions, topical speeches and declamations. *I*; (2).

Prerequisite: Public Speaking 1 and 2.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
Public	7	2	—	—	3	—	3	—	320 U. H.	Sarett
Speaking										

10. Interpretation and Dramatization of Literature.—Oral interpretation of standard literature; interpretation and staging of plays. *II*; (2).

Prerequisite: Public Speaking 1.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Public	10	2	A	1	—	1	—	—	—	Phelps
Speaking			B	—	1	—	1	—	—	Phelps
			C	3	—	3	—	—	—	Phelps
			D	—	3	—	3	—	—	Phelps

ENTOMOLOGY

STEPHEN ALFRED FORBES, Ph.D., LL.D., *Professor*

ALEXANDER DYER MACGILLIVRAY, Ph.D., *Associate Professor*

JUSTUS WATSON FOLSOM, D.Sc., *Assistant Professor*

ROBERT DOUGLAS GLASGOW, Ph.D., *Instructor*

EDNA MOSHER, Ph.D., *Instructor*

JACOB RAY STEAR, B.S., *Assistant*

Major: 20 hours from courses offered in the department, except Entomology 1a-1b, 4, 16, and 19.

Minors: 20 hours in botany, physiology, zoology, horticulture, and agronomy (see page 21).

Beginning courses open to freshmen and without prerequisites are 1a, 1b, and 4. Course 1a may best be followed by 2 or 4, course 1b by 2 or 7, and course 15 by 7 for juniors and 18 for seniors. Students preparing for service as economic entomologists should take as many of the courses offered as possible, including especially 1a, 2, 4, 7, and 8. Those preparing for the teaching of zoology should take 1a or 1b, and 2 and 4 or 15 and 14.

Courses for Undergraduates

1a. Elementary Entomology.—The structure, function, interrelations, origin, and development of insects, and the simpler generalizations of biological theory illustrated with insect material. Especially recommended as preliminary to Entomology 4, and for prospective teachers of zoology. Lectures, field, laboratory, and quiz work. (Students may not receive credit for both 1a and 1b.) *I* or *II*; (3).

Subject	No. Credits	Section	EITHER SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology 1a	3	Lecture	—	—	—	—	2	—	229 N. H.	Folsom
		Laboratory	1,2	—	1,2	—	—	—	405 N. H.	Glasgow

1b. Elementary Entomology.—The life, development, anatomy, and classification of insects, together with the identification of some common species. Designed for those who wish to acquaint themselves with the most interesting phases of insect life, especially as a preparation for teaching. (Students may not receive credit for both 1a and 1b.) *I*; (3).

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology 1b	3	Lecture	—	—	—	—	—	10	229 N. H.	MacGillivray
		Laboratory	—	1,2	—	1,2	—	—	217 N. H.	Mosher

2. General Entomology.—Morphological, physiological, and systematic entomology; the collection and preservation of specimens; field observations; studies of adaptive structures; classification and determination of insects; studies of life histories. *I*; (5).

Prerequisite: Entomology 1a or 1b.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology 2	5	—	10,11	10,11	10,11	10,11	10,11	—	405 N. H.	Folsom Glasgow

7. Systematic Entomology.—The external anatomy of insects; terminology of the parts; identification of specimens representing as many as possible of the major groups. *II*; (5). *Time to be arranged.* Associate Professor MACGILLIVRAY

Prerequisite: Entomology 1a or 1b.

9. Advanced Systematic Entomology.—The identification of the characters on which genera and species are based. *I*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY

Prerequisite: Entomology 7.

4. Introduction to Economic Entomology.—Lectures; field work; laboratory. Primarily for students in the College of Agriculture; it may not be counted for satisfaction of group requirements in the College of Liberal Arts and Sciences.) *I* or *II*; (3).

Subject	No. Credits	Section	EITHER SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology 4	3	A, Laboratory	8	—	8	—	8	—	408 N. H.	Folsom
		B, Laboratory	10	—	10	—	10	—	408 N. H.	Glasgow
		Lecture	9	—	9	—	9	—	229 N. H.	Folsom

19. Insects of the House, Garden, and Home Premises.—The life history, identification, and methods of control of those insects which may affect the food, clothing, or health of the family, as well as the common pests of garden and ornamental plants. Primarily for students in household science. *I* or *II*; (2).

Prerequisite: One year of university work.

Entomology

Subject	No. Credits	Section	EITHER SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology	19	Lecture	—	—	—	9	—	—	229 N. H.	Mosher
		Laboratory	1,2	—	—	—	—	9,10	217 N. H.	Mosher

16. Apiculture.—The essentials of bee-keeping. Practical operations; laboratory observations; collateral reading. *II*; (2).

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology	16	—	—	1,2	—	1,2	—	—	Insectary	Folsom

13. Medical Entomology.—Insects and the transmission of disease; methods of control and prevention. (Primarily for advanced students preparing for medicine.) *I*; (3).

Prerequisite: Zoology 3, or its equivalent in microscopical technic.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology	13	—	9	—	9	—	9	—	— N. H.	Glasgow

(Arrange three additional hours)

5. Introduction to Research.—Library, language, manuscript, and advanced laboratory work on assigned topics. Required as a preparation for entomological thesis work. *I* or *II*; (3). *Time to be arranged.*

Associate Professor MACGILLIVRAY, Assistant Professor FOLSOM

Prerequisite: Entomology 1, 2, 4, 8, or 1, 7, 9.

6a-6b. Thesis Investigation.—Subject selected during the junior year. Three hours a day given to investigation, under the supervision of an instructor during the senior year. *I* or *II*; (5). *Time to be arranged.*

Associate Professor MACGILLIVRAY, Assistant Professor FOLSOM

Prerequisite: Entomology 5.

Courses for Advanced Undergraduates and Graduates

15. Introductory Course.—Lectures on the metamorphosis and development of insects, characteristics of the orders, suborders, and more important families; the habits of representative species; the anatomy of immature and adult insects; and the classification of insects. (Not open to students who have had courses 1 and 2. Those who have had only one of the above courses, may take this course for half credit only.) *I*; (3).

Prerequisite: Two years of university work.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology	15	—	10	—	10	—	10	—	229 N. H.	MacGillivray

8a-8b. Advanced Economic Entomology.—Assigned problems. Field, laboratory, insectary, library, and manuscript work, with practise in the operations of economic entomology. (Intended to prepare students for service as entomologists in experiment stations and other state and government positions. Agronomy 7 and Horticulture 1, 2, and 3 should also be taken as a part of this preparation.) *I, II*; (3).

Prerequisite: Entomology 4.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Entomology	8a	—	1,2	—	1,2	—	1,2	—	Vivarium	Folsom

Entomology 8b 3 Schedule same as for 8a (first semester).

10. Taxonomy of Immature Insects.—*I or II; (3). Time to be arranged.*

Associate Professor MACGILLIVRAY, Dr. MOSHER

Prerequisite: Entomology 7 or 18a.**11. Classification of the Coccidae.**—Methods of preparing scale insects for study, the identification of genera and species, and discussion of their morphology, metamorphosis, and phylogeny. *II; (5). Time to be arranged.*

Associate Professor MACGILLIVRAY, Dr. MOSHER

Prerequisite: Entomology 7 or 18a.**17a-17b. Insect Organogeny.**—More important system of organs of adult and immature insects. Laboratory. *I, II; (3). (½ unit.) Time to be arranged.*

Associate Professor MACGILLIVRAY, Dr. MOSHER

Prerequisite: Entomology 7 and 9; senior standing.**18a-18b. Insect Taxonomy.**—Structures used in the classification of insects and the identification of a representative collection of insects. Laboratory. *I, II; (5). Time to be arranged.*

Dr. MOSHER

Prerequisite: Three years of university work.**12a-12b. Current Literature.**—Reports and discussion on assigned topics; presentation and discussion of contents of recent entomological publications, and of results of personal research. *I, II; (1).**Prerequisite:* One year of work in entomology.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Entomology	12a	1	—	4	—	—	—	—	—	405 N. H.
SECOND SEMESTER										
Entomology	12b	1		Schedule the same as for 12a (first semester).						

Instructor
Folsom**Courses for Graduates****102. Research in the Morphology and Embryology of Insects.**—*Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Assistant Professor FOLSOM

108. Research in Economic Entomology.—*Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Assistant Professor FOLSOM

109. Research in Systematic Entomology.—*Twice a week; I, II; (1 or 2 units). Time to be arranged.*

Associate Professor MACGILLIVRAY

FARM MANAGEMENT

(See ANIMAL HUSBANDRY)

FINE ARTS

(See ART AND DESIGN and MUSIC. Attention is called also to the courses in ESTHETICS offered by the departments of PHILOSOPHY, EDUCATION, ARCHITECTURE, and HOUSEHOLD SCIENCE)

FLORICULTURE

(See HORTICULTURE)

FRENCH

(See ROMANCE LANGUAGES AND LITERATURE)

GEOLOGY

(Including MINERALOGY, PALEONTOLOGY, and GEOGRAPHY)

ELIOT BLACKWELDER, Ph.D., *Professor*CHARLES WESLEY ROLFE, M.S., *Professor, Emeritus*WILLIAM SHIRLEY BAYLEY, Ph.D., *Professor*

Geology

THOMAS EDMUND SAVAGE, Ph.D., *Associate Professor*

CHARLES WELDON TOMLINSON, Ph.D., *Associate*

JOHN LYON RICH, Ph.D., *Instructor*

FRANCIS MAURICE VAN TUYL, Ph.D., *Instructor*

LUTHER EUGENE KENNEDY, A.M., *Assistant*

RALPH DANIEL REED, A.B., *Assistant*

Major: One of the elementary courses (1, 3, 13, 5, or 35), followed by 20 hours in courses that have prerequisites in the department, except that courses 5 and 14 may be included by students who take course 1, 3, or 35.

Minors: 20 hours selected from any one or two of the following departments: astronomy, botany, chemistry, entomology, physics, and zoology. Students specializing in geography may add to this list sociology, economics, or history.

Courses for Undergraduates

1. General Geology.—The material and structure of the earth, the processes of change at work on and in it, the origin of its mineral resources, and a summary of its history. Four hours discussion; two hours laboratory; two field trips. Not open to students who have had Geology 3 or 13. Students who have had Geology 35 will receive only 3 hours credit. *I or II; (5).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	1	5	A ¹	9	9	9	9	—	—	247 N. H.	Blackwelder
			B	—	2	2	2	2	—	247 N. H.	
			Laboratory	(2 hours arrange)						251 N. H.	Reed
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			A ¹	9	9	9	9	2,3	—	247 N. H.	Tomlinson
			B	—	2	2	2	2	—	247 N. H.	
			Laboratory	(2 hours arrange)						251 N. H.	Reed

35. General Geography.—Features and processes of the lands, oceans, and atmosphere. Recitations; laboratory; two Saturday field trips. Students who have had Geology 1 or 3 will receive only three hours' credit in Geology 35. *I or II; (5).*

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	35	5	—	8	8	8	8	—	—	247 N. H.	Rich
1,2 or 1,2											

5. General Mineralogy.—The commoner minerals of scientific and economic importance; includes some crystallography and blow-pipe analysis. Lectures; laboratory. *I; (5).*

Prerequisite: Chemistry 1 and 2, or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	5	5	—	8,9	8,9	8,9	8,9	8,9	—	147 N. H.	Bayley Kennedy

5a. Rock-Forming Minerals.—(A continuation of Geology 5.) The silicate minerals. Quiz; laboratory. *II; (3).*

Prerequisite: Geology 5.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	5a	3	—	(Arrange)						147 N. H.	Van Tuyl

¹Section A in each case is reserved for students who have had an elementary course in chemistry.

13a. Physical Geology.—Minerals and rocks. Especially for students in technical courses. Lectures; laboratory. *I*; (3).

Prerequisite: Chemistry 1, 2a; Physics 1a-1b, or equivalent.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13a	3	A	10	—	10	—	10	—	247 N. H.	Van Tuyl
			B	10	—	—	—	10	—	247 N. H.	Kennedy
			A,Laboratory	(4 hours, arrange)						147 N. H.	—
			B,Laboratory	11	—	11	—	11	—	147 N. H.	Kennedy

13b. Physical Geology.—Dynamic and structural geology. Lectures; laboratory. *II*; (3).

Prerequisite: Geology 13a.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	13b	3	Lectures	10	—	10	—	10	—	247 N. H.	Bayley
			Laboratory	11	—	—	—	—	—	147 N. H.	Kennedy

14. Meteorology.—The atmosphere and its processes; ocean currents; climate, weather and forecasting. *I*; (3).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	14	3	—	1	—	1	—	1	—	249 N. H.
										Instructor
										—

9. Invertebrate Paleontology.—The more important fossils, in biological groups. Lectures; laboratory. *I*; (5).

Prerequisite: Geology 1 or 3; or 12 hours in zoology.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	9	5	—	1,2	8	1,2	8	1,2	—	238 N. H.
										Instructor
										Savage

22. History of Organic Evolution.—The evolution of plants and animals, as indicated by the fossil record. *I*; (3).

Prerequisite: Geology 1 or 3, or Zoology 1, or Botany 1.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	22	3	—	—	—	8	—	8	—	238 N. H.
										Instructor
										Savage
										Laboratory (2 hours, arrange).

2. Economic Geology.—The origin and distribution of the important mineral deposits of North America. Lectures; recitations. *II*; (3).

Prerequisite: Geology 1 and 5, or 13b.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	2	3	—	3	—	3	—	3	—	150 N. H.
										Instructor
										Tomlinson

4a. Structural Geology.—Nature and origin of the sedimentary, igneous and deformative structures of rocks. Discussions and laboratory. *II*; (3).

Prerequisite: Geology 1, 3 or 13, or 35.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Geology	4a	3	—	—	3	—	3	—	—	—
										Instructor
										Tomlinson
										Laboratory (2 hours, arrange).

36. Petrology.—Practise in the laboratory and field identification of the common rocks. Laboratory. *II*; (2).

Prerequisite: An elementary course in geology.

Geology

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Geology	36	2	—	1,2	—	1,2	—	—	147 N. H.	VanTuy1

40. Reconnaissance Surveys.—Rapid methods of making topographic and geologic surveys. Exploratory mapping. Field and laboratory. (Primarily for military and geology students.) *I* or *II*; (1).

Prerequisite: Consent of instructor.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Geology	40	1	—	—	—	—	—	—	—	Tomlinson

SECOND SEMESTER
(4 hours, arrange) — Blackwelder

8. Geography of Europe.—The effect of the physiographic features of Europe on its climate, resources, population and industries. *II*; (3).

Prerequisite: Geology 1, 3, or 35.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Geology	8	3	—	—	—	—	—	—	249 N. H.	—

[10. Geography of Central and South America.—Similar to Geology 8. *II*; (3). (Not given, 1917-18).

Prerequisite: Geology 1, 3, or 35.]

[11. Geography of North America.—Similar to Geology 8 and 10. Lectures; reading; map study. *II*; (3). (Not given, 1917-18.)

Prerequisite: Geology 1, 3, or 35.]

37. Human Geography.—The influence of topography, climate, and other physiographic factors on human life and history. Recitations. *I*; (3).

Prerequisite: Geology 35, 1, or 3.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Geology	37	3	—	—	—	—	—	—	126 N. H.	Rich

Laboratory (2 hours, arrange).

38. Regional Geology of North America.—The geologic structure, mineral resources, and surface features of North America, considered as results of its history. Direct continuation of Geology 1 and 3. Discussions. *II*; (3).

Prerequisites: Geology 1, 3, or 13b.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Geology	38	3	—	—	—	—	—	—	247 N. H.	Tomlinson

39. Geology of Illinois.—The stratigraphy, structure, geologic history, and resources of the state. *II*; (3).

Prerequisite: Geology 1, 3 or 13b.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Geology	39	3	—	—	—	—	—	—	238 N. H.	Savage

19. Field Geology.—Excursion to some important district within 300 miles of Urbana during the Easter recess. The cost of the trip will be about \$30.00. Credit on basis of written report. *II*; (1). Members of the department

Prerequisite: Geology 1, 3, 13b, or 35.

19a. Field Geology.—Students who have had Geology 19 and wish to visit another locality the following year should register for 19a. The conditions are the same as for 19. *II*; (1). Members of the department

41. Summer Field Survey.—The detailed survey and analysis of a small selected district. Professional standards in both work and report will be required. For 1918 the field will probably be in eastern Wyoming. Party limited to ten, approved in advance. (For further details see Summer Session Bulletin.) *Eight weeks in the summer*; (10). Professor BLACKWELDER

Prerequisite: One year in geology.

Courses for Advanced Undergraduates and Graduates

NOTE.—Junior standing is required for these courses.

6. Optical Mineralogy.—Introduction to the microscopic study of minerals, by means of their behavior in polarized light. Two lectures; four hours laboratory. *I*; (3).

Prerequisite: Geology 13a or 5.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	6	3	—							251 N. H.	Bayley Kennedy

7. Petrography.—The principles learned in Geology 6 applied to the study of rocks. The different types of rocks; their origin and classification. Study of representative suite of specimens in the hand specimen and thin section. *II*; (3).

Prerequisite: Geology 6.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	7	3	—							251 N. H.	Bayley Kennedy

[15. Structural Geology.—Rock deformation and its results. Discussions; laboratory. *II*; (3). (Not given, 1917-18.)

Prerequisite: Geology 1, 3, or 13b.]

[16. Stratigraphy.—The successive geologic formations and the fossil faunas by which they are correlated, with special reference to the United States. *II*; (5). (Not given, 1917-18).

Prerequisite: Geology 9 and 17.]

17. Earth History.—Physical conditions and events in the geological periods, with special reference to North America; discussions; lectures. *I*; (3). Given in 1917-18 and in alternate years.

Prerequisite: One year in geology.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	17	5								249 N. H.	Blackwelder

42. Stratigraphic Paleontology.—The invertebrate index fossils of the successive geologic formations, from the Cambrian to the Tertiary. *I, II*; (3). *Time to be arranged.* Associate Professor SAVAGE

Prerequisite: Geology 16 and senior standing.

23. Physiography of the Lands.—The making of topographic features as controlled by such factors as climate and rock structure. Physiographic history. Recitations; laboratory; two Saturday field trips. *II*; (3).

Prerequisite: Geology 35, 1, 3, or 13b.

Geology

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	23	3	—	11	—	—	—	11	—	126 N. H.	Rich
Laboratory (2 hours, arrange)											

24. Physiographic Interpretations.—The application of physiographic principles to the interpretation of recent earth history. *I*; (3). Given in 1917-18 and alternate years.

Prerequisite: Geology 23.

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Geology	24	3	—	10	—	—	—	10	—	126 N. H.	Rich
Laboratory (2 hours, arrange).											

31. Geology of Oil and Gas.—Origin and relations of the natural hydro-carbons; their distribution in space and in rock sequence. A two-day trip to the main oil fields of Illinois will be required, involving an expense of about \$10.00. *II*; (3).

Prerequisite: One year of geology including Geology 1 or 3 or 13b, and junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	31	3	Lecture	2	—	2	—	—	—	249 N. H.	Tomiinson
Laboratory				(Arrange)							

45a-45b. Geological Conference.—All members and advanced students of the department participate in this for the purpose of considering the results of investigations, reviews of important publications, and special lectures. Credit given only to those advanced students authorized to register for the course. *I, II*; (1).

Prerequisite: An elementary course in geology.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Geology	45a	1	—	—	—	—	4	—	—	241 N. H.	Blackwelder

Subject	No.	Credits	SECOND SEMESTER			
			Schedule the same as for 45a (first semester).			
Geology	45b	1				

Courses for Graduates

For graduate work in geology the student must have a thoro training in the principles of the science, and must have done advanced work in at least one of its branches. Except in unusual cases, which will be decided on their merits, at least 20 hours of geology and two or more weeks of field experience will be required. Graduate students with adequate technical preparation in other sciences may be admitted to graduate courses in certain subjects, such as crystallography.

101. Advanced Crystallography.—Methods used in measuring, projecting, and calculating crystal forms, and determining the physical properties of crystallized bodies. *Twice a week; I, II; (1 unit). Time to be arranged.* Professor BAYLEY

102. Igneous Petrography.—The igneous rocks, identification of types, classification, and relationships. Lectures; laboratory. *Twice a week; I; (1 unit).* Professor BAYLEY

103. Metamorphic Petrography.—Microscopic study of the metamorphic rocks and the interpretation of their origin. *Twice a week; II; (1 unit).* Professor BAYLEY

105. Paleontologic and Stratigraphic Problems.—The study of fossil invertebrates, by either zoological or faunal groups. *One to three times a week; I, II; (1 unit). Time to be arranged.* Associate Professor SAVAGE

108. Ore Deposition.—Problems in the origin of ore deposits, as illustrated by selected mining districts. *Three times a week; I, II; (1 unit). Time to be arranged.*

Professor BAYLEY

125. Sedimentation.—The interpretation of sedimentary rocks in terms of their origin. *Twice a week; I, II; (1 unit). Given in 1917-18 and alternate years.*

Professor BLACKWELDER

[126. Historical Problems.—Critical study of important questions of geologic history. *Twice a week; I, II; (1 unit). (Not given, 1917-18.)]*

135. Research.—Individual work under the supervision of members of the staff in their respective fields. *Once a week; I, II. Time to be arranged.*

Professor BLACKWELDER, Professor BAYLEY, Associate Professor SAVAGE, Dr. RICH

136. Seminar in Physical Geology.—Special problems in mineralogy, petrography, economic geology, metamorphism, and related subjects. *Once a week; I, II; (1 unit). Time to be arranged.*

Professor BAYLEY

[137. Seminar in Historical Geology.—Special problems in historical geology, paleontology, correlation, and allied subjects. *Once a week; I, II; (1 unit). (Not given, 1917-18.)]*

GERMANIC LANGUAGES AND LITERATURE

(Including SCANDINAVIAN)

JULIUS GOEBEL, Ph.D., *Professor*

OTTO EDUARD LESSING, Ph.D., *Professor*

GEORGE TOBIAS FLOM, Ph.D., *Associate Professor, Scandinavian*

NEIL CONWELL BROOKS, Ph.D., *Assistant Professor*

LEONARD BLOOMFIELD, Ph.D., *Assistant Professor, Comparative Philology and German*

CHARLES ALLYN WILLIAMS, Ph.D., *Associate*

DAISY LUANA BLAISDELL, A.M., *Instructor*

ARMIN HAJMAN KOLLER, Ph.D., *Instructor*

HEINRICH WALDEMAR NORDMEYER, Ph.D., *Instructor*

OSCAR FRIEDRICH WILHELM FERNSEMER, Ph.D., *Instructor*

MAXIMILIAN JOSEF RUDWIN, Ph.D., *Instructor*

BERNHARD ALEXANDER UHLENDORF, A.M., *Assistant*

GERMAN

Major: 20 hours in German, excluding German 1, 2, and 3, and including at least 6 hours of primarily fourth-year courses.

Minors: 20 hours in not more than two subjects chosen from the following list: languages, education, history, philosophy, and psychology, provided that 8 hours must be selected from a language other than German.

GERMANIC LANGUAGES

Major: 20 hours in German and the Scandinavian languages, provided that at least 8 hours must be in German and 8 hours in one Scandinavian language. Only German courses above the second year, and Scandinavian courses exclusive of Scandinavian 6 and 12 will be acceptable.

Minors: 20 hours in not more than two subjects chosen from the following list: languages, education, history, philosophy, and psychology.

Germanic Languages and Literature

A. GERMAN

First-Year Courses

1. Elementary Course.—Grammar and easy reading for beginners. (Two sections are offered in the second semester for students who enter the University in the second semester.) *I* or *II*; (4).

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Instructor
German	1	4	A	—	8	8	8	8	—	Bloomfield
			B	—	9	9	9	9	—	Brooks
			C	—	10	10	10	10	—	Blaisdell
			D	—	11	11	11	11	—	Koller
			E	1	1	1	1	—	—	Uhlendorf
			F	2	2	2	2	—	—	Fernsemer
			G	3	3	3	3	—	—	Nordmeyer

SECOND SEMESTER										
			A	2	2	2	2	—	—	Fernsemer
			B	3	3	3	3	—	—	Uhlendorf

2. Narrative Prose.—Grammar and reading. *I*; (4).

Prerequisite: One year of high-school German or German S 1, or German 1 taken in the second semester.

NOTE.—Students who have had no German for one year or more will be required to take a written test before entering German 2. This will be regarded as a *test of present ability in German* and not as an examination on any particular course previously taken in this subject.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Instructor
German	2	4	A	—	8	8	8	8	—	Uhlendorf
			B	—	9	9	9	9	—	Uhlendorf
			C	1	1	1	1	—	—	Williams

3. Narrative Prose.—(Continuation of German 1.) Reading and grammar. *II*; (4).

Prerequisite: German 1, or equivalent demonstrated by examination.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Instructor
German	3	4	A	—	8	8	8	8	—	Bloomfield
			B	—	9	9	9	9	—	Brooks
			C	—	10	10	10	10	—	Blaisdell
			D	—	11	11	11	11	—	Koller
			E	1	1	1	1	—	—	Uhlendorf
			G	3	3	3	3	—	—	Nordmeyer

Second-Year Courses

4. Prose Reading.—Selections from standard prose writers; sight reading; composition. *I* or *II*; (4).

Prerequisite: German 2 or 3, or two years of high-school German, or equivalent demonstrated by examination.

Germanic Languages and Literature

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
German	4	4	A	—	8	8	8	8	—	312 U. H.	Blaisdell	
			B	—	9	9	9	9	—	312 U. H.	Bloomfield	
			C	—	10	10	10	10	—	310 U. H.	Koller	
			D ¹	—	11	11	11	11	—	312 U. H.	Blaisdell	
			E	—	11	11	11	11	—	213 U. H.	Rudwin	
			F	1	1	1	1	—	—	312 U. H.	Fernsemer	
			G	3	3	3	3	—	—	212 U. H.	Fernsemer	
SECOND SEMESTER												
			A	—	8	8	8	8	—	312 U. H.	Blaisdell	
			B	—	9	9	9	9	—	213 U. H.	Uhlendorf	
			C	1	1	1	1	—	—	311 U. H.	Williams	

5. Narrative and Historical Prose.—At the option of the instructor one classic in verse may also be read. Composition. *I* or *II*; (4).

Prerequisite: German 4, or three years of high-school German, or equivalent demonstrated by examination.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
German	5	4	A	—	10	10	10	10	—	311 U. H.	Rudwin	
			B	—	11	11	11	11	—	311 U. H.	Williams	
			C	2	2	2	2	—	—	310 U. H.	Nordmeyer	
			Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
			A	—	9	9	9	9	—	311 U. H.	Rudwin	
			B	—	10	10	10	10	—	310 U. H.	Koller	
			C ¹	—	11	11	11	11	—	312 L. H.	Blaisdell	
			D	1	1	1	1	—	—	312 U. H.	Fernsemer	

6. Scientific German.—The rapid reading of works of a general scientific character. (Parallel with 5. Students may not take both 5 and 6 for more than a total of four hours' credit without special permission of department.) *II*; (4).

Prerequisite: German 4, or three years of high-school German, or equivalent demonstrated by examination.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	6	4	A	—	8	8	8	8	—	212 U. H.	Uhlendorf
			B	—	9	9	9	9	—	— U. H.	Nordmeyer
			C	—	11	11	11	11	—	213 U. H.	Rudwin

Third-Year Courses

7. Modern Fiction.—(Intended primarily for students who take 5 in the first semester. Not open to those who have had any course more advanced than 5.) *II*; (3).

Prerequisite: German 5, or equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
German	7	3	A	11	—	11	—	11	—	311 U. H.	Williams	
			B	2	—	2	—	2	—	310 U. H.	Nordmeyer	

10. Introductory Goethe Course.—Reading of works illustrating different periods in Goethe's development: *Goetz von Berlichingen*; *Egmont*; *Iphigenie auf Tauris*; selections from *Dichtung und Wahrheit*. *II*; (3).

Prerequisite: German 14, or 16, or 24, or 28a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	10	3	A	10	—	10	—	10	—	212 U. H.	Brooks
			B	11	—	11	—	11	—	310 U. H.	Fernsemer

¹Honor section to which students are admitted only by special permission from the department.

Germanic Languages and Literature

14. Introductory Schiller Course.—Works illustrating different periods in Schiller's development: *Lyrics and Ballads*; *Kabale und Liebe*; *Braut von Messina*. *I*; (3).

Prerequisite: German 5, or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	14	3	A	10	—	10	—	10	—	212 U. H.	Brooks
			B	11	—	11	—	11	—	212 U. H.	Fernsemer

16. Elementary Composition and Conversation.—*I* or *II*; (2).

Prerequisite: German 5, or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor	
				M	T	W	T	F	S			
				—	10	—	10	—	—			
German	16	2	A	—	10	—	10	—	—	213 U. H.	Uhlendorf	
			B	—	1	—	1	—	—	310 U. H.	Rudwin	
—			SECOND SEMESTER						312 U. H.	Bloomfield		
			—	9	—	9	—	—				

17. Intermediate Composition and Conversation.—*I* or *II*; (3).

Prerequisite: German 16.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	17	3	— —	9	—	9	—	9	—	310 U. H.	Koller
				SECOND SEMESTER							
			A	9	—	9	—	9	—	312 U. H.	Blaisdell
			B	1	—	1	—	1	—	212 U. H.	Rudwin

23. German Novel.—Rapid reading of representative novels, beginning with Goethe's *Werther*. Assigned readings. (This is a distinctly more advanced course than German 7). *II*; (3).

Prerequisite: German 14, or 16, or 24, or 28a, or 7.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	23	3	—	9	—	9	—	9	—	310 U. H.	Koller

24. Modern German Drama.—Rapid reading of dramas by Grillparzer, Hebbel, Hauptmann, and others. *I*; (3).

Prerequisite: German 5, or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	24	3	—	9	—	9	—	9	—	311 U. H.	Rudwin

28a-28b. German Lyrics and Ballads.—Their form, development and various types; the *Volkssied* of the eighteenth and nineteenth centuries and its influence. First semester: the early eighteenth century and the classical period. Second semester: the nineteenth century. (The first semester may be taken separately, but not the second without the first.) *I, II*; (2).

Prerequisite: German 5, or equivalent, and sophomore standing.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
German	28a	2	—	9	—	9	—	—	310 U. H.	Williams

			SECOND SEMESTER							
German			Schedule the same as for 28a (first semester).							

Primarily Fourth-Year Courses

NOTE.—For a major in German students are required to take at least six hours of these primarily fourth-year courses; seniors who are preparing to teach German should take German 29.

8. Schiller.—The life of Schiller; *Wallenstein* and other selections. *II*; (3).

Prerequisite: Three years of college German, or equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	8	3	—	2	—	2	—	2	—	205 L. H.	Lessing

19a-19b. Goethe's Faust.—The Faust legend and early Faust books and plays; the genesis of Goethe's *Faust*; reading of both parts. *I, II*; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	19a	2	—	—	11	—	11	—	—	215 L. H.	Goebel

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	19b	2	—	Schedule the same as for 19a (first semester).							

25. Teachers' Course.—Discussion of methods; examination of text-books. (Open to seniors and special students who have 20 hours' credit in German. This course may not be taken for credit by graduate students.) *II*; (2).

Prerequisite: Completion of, or registration in Education 1 or equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	25	2	—	—	9	—	9	—	—	— U. H.	Koller

26a. German Literature to the End of the Reformation.—Lectures; recitations; reports on assigned reading. *I*; (3).

Prerequisite: German 10, or 23, or 24, or 28a-28b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	26	3	—	3	—	3	—	3	—	205 L. H.	Lessing

26b. German Literature Since the Reformation.—Lectures; recitations; reports on assigned collateral reading. *II*; (3).

Prerequisite: German 26a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	26b	3	—	3	—	3	—	3	—	205 L. H.	Lessing

27. Lessing.—The Life of Lessing. Study of his plays and dramatic theory. *I*; (3).

Prerequisite: Three years of college German, or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	27	3	—	2	—	2	—	2	—	205 L. H.	Lessing

29a-29b. Advanced Composition.—Themes on Germany and German life, based on suitable reading, discussed in German. *I, II*; (3).

Prerequisite: German 17 for 29a; 29a for 29b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	29a	3	—	1	—	1	—	1	—	310 U. H.	Nordmeyer

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	29b	3	—	Schedule the same as for 29a (first semester).							

Germanic Languages and Literature

30a-30b. Thesis Course.—(Intended primarily for candidates for honors in German, but open to other seniors.) *I, II; (1 or 2).*¹

Prerequisite: Senior standing, and three years of college German or equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
German	30a	1 or 2 ¹	—							
(Arrange)										
SECOND SEMESTER										
German	30b	1 or 2 ¹	—							
(Arrange)										

Instructor
Goebel
Lessing
Brooks
Bloomfield

31. Middle High German.—*I; (2).*

Prerequisite: Senior or graduate standing; three years of college German.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
German	31	2	—	—	—	10	—	10	—	215 L. H.

Instructor
Goebel

Courses for Graduates

Students desiring to take German as a major should have completed a four years' course of undergraduate study in German, corresponding to the four years' course at this University, and should be familiar with the principal works of the writers of the classical and modern periods of German literature, show a general knowledge of the history of German literature, and be able to follow lectures in the German language.

A reading knowledge of Latin and French is required. It is desirable that candidates for the degree of Ph.D. have some knowledge of Greek. All students are expected to have had a course in German history.

101. Seminar in Germanic Philology.—Training in original research; results of special value may be published in the *Journal of English and Germanic Philology*. *Once a week; I, II; (1 unit).*

BOTH SEMESTERS										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
German	101	1 unit	—	10,11	—	—	—	—	—	203-A L. H.

Instructor
Goebel

103. Introduction to the Historical Study of the Germanic Languages.—History of German Philology; comparative grammar of the Old Germanic dialects. Lectures; discussions of special topics. *Twice a week; II; (1 unit).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
German	103	1 unit	—	—	10	—	10	—	—	215 L. H.

Instructor
Goebel

104. Gothic.—Grammar and literature. *Twice a week; I; (1 unit).*

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
German	104	1 unit	—	—	10	—	10	—	—	215 L. H.

Instructor
Goebel

105. Old High German.—Grammar and interpretation of the oldest literary documents. *Three times a week; II; (1 unit).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
German	105	1 unit	—	9	—	9	—	9	—	215 L. H.

Instructor
Williams

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

[109. **Goethe's and Schiller's Philosophy.**—*Twice a week; I, II; (1 unit).*
(Not given, 1917-18.)]

110. **Early German Drama.**—German drama to the time of the Reformation; medieval religious drama; Shrovetide plays; beginning of the humanistic drama. *Twice a week; I; (1 unit).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	110	1 unit	—	3	—	3	—	—	—	215 L. H.	Brooks

113. **German Literature of the Fifteenth and Sixteenth Centuries.**—Survey of the literature on the background of the general history of the time; Luther and the Reformation; Mastersingers and folksongs; the Reformation drama; Hans Sachs; Brant; Fischart; the chap books; the English comedians. *Twice a week; II; (1 unit).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	113	1 unit	—	3	—	3	—	—	—	215 L. H.	Brooks

115. **History of German Literature of the Nineteenth Century.**—*Twice a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
German	115	1 unit	—	—	2	—	2	—	—	205 L. H.	Lessing

[116. **Medieval German Literature with Reference to Political, Religious, and Social History.**—Research. *Twice a week; I; (1 unit).* (Not given, 1917-18.)]

117. **History of German Literature During the Eighteenth Century.**—*Twice a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
German	117	1 unit	—	—	—	11	—	11	—	215 L. H.	Goebel

[118. **The German Drama Since Schiller.**—Research. *Twice a week; I, II; (1 unit).* (Not given, 1917-18.)]

119. **The German Novel.**—Research. *Twice a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
German	119	1 unit	—	—	3	—	3	—	—	205 L. H.	Lessing

121. **Walther von der Vogelweide.**—Lectures and interpretations. *Twice a week; II; (1 unit).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
German	121	1 unit	—	—	—	10	—	10	—	215 L. H.	Goebel

121a. **The Nibelungenlied.**—Lectures and interpretations. *Twice a week; II; (1 unit).* Professor GOEBEL

[121b. **Gudrun.**—Lectures and interpretations. *Twice a week; II; (1 unit).* (Not given, 1917-18.) Professor GOEBEL]

B. SCANDINAVIAN

Undergraduate Courses Not Open to Freshmen

[1a-1b. **Elementary Norwegian.**—Grammar; conversation; reading from Björnson, Lie, and Ibsen. *I; (3); II; (2).* (Not given, 1917-18.)]

2a-2b. **Elementary Swedish.**—Grammar; pronunciation; composition; easy reading. *I, II; (2).*

Germanic Languages and Literature

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	2a	2	—	9	—	9	—	—	—	209 L. H.	Flom

				SECOND SEMESTER						
Scandinavian	2b	2	—	Schedule the same as for Scandinavian 2a (first semester).						

3a-3b. Intermediate Norwegian.—First semester: Ibsen's *Brand* and *Peer Gynt*. Second semester: Björnson's *En Fallit* and selections from recent writers. *I, II; (2).*

Prerequisite: Scandinavian 1 or the equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	3a	2	—	(Arrange)						209 L. H.	Flom

				SECOND SEMESTER						
Scandinavian	3b	2	—	Schedule the same as for Scandinavian 3a (first semester).						

6. Henrik Ibsen.—Lectures; interpretation of three of the social dramas; Ibsen's technic. Archer's translation is used. *II; (2).*

Prerequisite: Junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	6	2	—	—	9	—	9	—	—	205 L. H.	Flom

12. Norse Mythology.—Outline of West European religion during the last centuries of paganism; the myths, beliefs, and religious cult of the Norsemen to the close of the Viking Age. *I; (2).*

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	12	2	—	—	9	—	9	—	—	205 L. H.	Flom

14. History of Old Norse Literature.—Lectures. The mythical and the heroic lays, the court poetry, the sagas, the ballads. *I; (2).*

Prerequisite: Senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	14	2	—	(Arrange)						209 L. H.	Flom

Courses for Graduates

Preparation for graduate work in the Scandinavian languages or literature must include a reading knowledge of one of the Scandinavian languages and systematic work in the undergraduate courses in Scandinavian or their equivalent. Any graduate student in language may, however, be admitted to the purely philological courses. Course 14 may be taken for graduate credit.

101. Old Norse.—Introduction to the language as a member of the Germanic group. Reading of the *Volsunga Saga* and selections from the Icelandic Sagas. *I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	101	1 unit	—	(Arrange)						209 L. H.	Flom

110. Advanced Old Norse.—Critical study of the mythical lays of the *Elder Edda* and selections from the *Speculum Regale* (*Konungs Skuggsjá*). *II; (1 unit).*

Prerequisite: Scandinavian 101 or the equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Scandinavian	110	1 unit	—	(Arrange)						209 L. H.	Flom

GREEK

(See CLASSICS)

HEBREW

(See ORIENTAL LANGUAGES AND LITERATURE)

HISTOLOGY

(See PHYSIOLOGY)

HISTORY

EVARTS BOUTELL GREENE, Ph.D., *Professor*
 CLARENCE WALWORTH ALVORD, Ph.D., *Professor*
 LAURENCE MARCELLUS LARSON, Ph.D., *Professor*
 ALBERT HOWE LYBYER, Ph.D., *Professor*
 ALBERT TEN EYCK OLMSTEAD, Ph.D., *Professor*
 WILLIAM SPENCE ROBERTSON, Ph.D., *Assistant Professor*
 PAUL VAN BRUNT JONES, Ph.D., *Associate*
 THEODORE CALVIN PEASE, Ph.D., *Associate*
 ARTHUR CHARLES COLE, Ph.D., *Associate*
 JAY EARLL MILLER, A.M., LL.B., *Instructor*
 ELIZABETH PARNHAM BRUSH, A.M., *Assistant*

Cooperating:

WILLIAM ABBOTT OLDFATHER, Ph.D., *Professor, Greek*
 HOWARD VERNON CANTER, Ph.D., *Associate Professor, Latin*

Major: 20 hours, excluding History 1a and 2a, and including (a) either History 1b or 2b; (b) six hours selected from courses for advanced undergraduates and graduates; and (c) any other courses offered in the department.

Minors: 20 hours, including (a) either Economics 1 or Political Science 1 and 3; and (b) one or two of the following subjects: economics, political science, law, sociology, the history of any literature, history of education, philosophy, and physiography. Courses in any foreign language may be accepted in satisfaction of this requirement, if the student can show his ability to read ordinary historical prose in that language.

Courses for Undergraduates

1a-1b. Continental European History.—Europe from the fourth century to the present time. (Either semester may be taken separately.) *I, II*; (4 or 3).¹

NOTE.—3 credits only for seniors.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
History	1a	4 or 3 ¹	Lecture	—	10	—	10	—	228 N. H.	Jones
			A	—	—	8	—	8	211 U. H.	Brush
			B	—	—	9	—	9	311 L. H.	Miller
			C	—	—	9	—	9	211 U. H.	Brush
			D ²	—	—	10	—	10	311 L. H.	Lybyer
			E	—	—	10	—	10	211 U. H.	Jones
			F	—	—	11	—	11	211 U. H.	Brush
			G	—	—	2	—	2	213 U. H.	Jones

SECOND SEMESTER

History 1b 4 Lectures given by Professor Lybyer.
 (Sections and schedule otherwise the same as for 1a (first semester).)

¹Three credits for seniors; four credits for students other than seniors.

²For sophomores and juniors in first semester; honor section in second semester.

History

2a-2b. English History.—First semester; political history of England to 1603; the larger social, economic, and religious movements. Second semester: the modern history of England; colonial and imperial development. *I, II;* (3 or 2).¹

NOTE.—Two credits only for seniors.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
History	2a	3 or 2 ¹	Lecture	—	8	—	—	—	—	418 U. H.	Larson
			A	8	—	—	—	—	—	211 U. H.	Brush
			B	—	—	—	1	—	—	419 U. H.	Miller
			C	—	—	—	—	8	—	419 U. H.	Larson
			D	—	—	—	—	8	—	418 U. H.	Miller
			E	—	—	—	—	11	—	418 U. H.	Miller
			F	—	—	—	—	1	—	418 U. H.	Larson

SECOND SEMESTER

History 2b 3 Sections and schedule the same as for 2a (first semester).

3a-3b. History of the United States.—First semester: the colonies in 1750; the French War and the Revolution; the genesis of the Federal Constitution; development under the Constitution to 1815. Second semester: a century of national development, 1815-1917. (Either semester may be taken separately.) *I, II;* (3).

Prerequisite: One year of college work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	3a	3	Lecture	8	—	—	—	8	—	100 Com.	} Robertso Cole Robertson Cole Greene Greene
			A	—	—	8	—	—	—	318 U. H.	
			B	—	8	—	—	—	—	212 U. H.	
			C	—	—	—	8	—	—	212 U. H.	
			D	—	—	8	—	—	—	213 U. H.	
			E	—	8	—	—	—	—	211 U. H.	

SECOND SEMESTER

History	3b	3	Lecture	8	—	—	—	—	—	100 Com.	} Greene Robertson Cole
			A	—	—	8	—	—	—	318 U. H.	
			B	—	8	—	—	—	—	318 U. H.	
			C	—	—	—	8	—	—	318 U. H.	Robertson
			D	—	—	8	—	—	—	213 U. H.	Cole
			E	—	8	—	—	—	—	211 U. H.	Robertson

5.² History of Greece.—*I;* (3). (See Greek 20.)

Prerequisite: One college course in history or the classics; sophomore standing.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
History	5	3	—	3	—	3	—	3	—	120 L. H.	Oldfather

6.² History of Rome.—*II;* (3). (See Latin 19.)

Prerequisite: One college course in history or the classics; sophomore standing.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
History	6	3	—	2	—	2	—	2	—	120 L. H.	Canter

¹Two credits for seniors; three credits for students other than seniors.

²Course 50, together with courses 5 and 6, furnishes a general survey of the ancient history of the Mediterranean world

8a-8b. Western Europe in the Middle Ages.—First semester: from Constantine to Charlemagne. Second semester: from Charlemagne to Dante. *I, II; (3).*

Prerequisite: One year of college work. Not open to students who have had 1a.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	8a	3	—	8	—	8	—	8	—	311 L. H.
										Instructor
										Jones

SECOND SEMESTER				
History	8b	3	Sections and schedule the same as for 8a (first semester).	
(Courses 8a-8b and 9a-9b will ordinarily be given in alternate years.)				

17. The History of Illinois.—The political, economic, and social development of a typical commonwealth in the Middle West, considered in its relation to the general course of American history. *I; (2).*

Prerequisite: Junior standing in any college of the University.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	17	2	—	—	11	—	11	—	—	305 L. H.
										Instructor
										Pease

18. The Teaching of History.—Preparation of students for the teaching of history in secondary schools. *I; (2).*

Prerequisite: History 1a-1b, 3a-3b, or their equivalent: senior standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	18	2	—	—	3	—	3	—	—	311 L. H.
										Instructor
										Cole

28a-28b. Thesis.—Special training in investigation for candidates for honors and for other seniors. *I, II; (2).* *Time to be arranged.*

Assistant Professor ROBERTSON

50.¹ The Ancient Near East.—The political and social history of Egypt, Babylonia, Assyria, Palestine, and the Hittites, to the rise of Persia. Intended primarily as background to Biblical and classical history. *I; (3).*

Prerequisite: Sophomore standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	50	3	—	11	—	11	—	11	—	311 L. H.
										Instructor
										Olmstead

51. Hebrew History.—A general history of the Hebrew people to the revolt under Hadrian; source problems, as they relate to Biblical criticism. An attempt will be made to correlate the Biblical history with the general history of the times. *II; (3).*

Prerequisite: Junior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
History	51	3	—	8	—	8	—	8	—	305 L. H.
										Instructor
										Olmstead

Courses for Advanced Undergraduates and Graduates

(Open to seniors and to juniors of high standing. The ability to use French and German is desirable.)

¹Course 50, together with courses 5 and 6, furnishes a general survey of the ancient history of the Mediterranean world.

History

4a-4b. The Constitutional History of England.—First semester: institutional origins. Second semester: modern constitutional practise. (Important for students specializing in history, political science, or law.) *I, II; (3).*

Prerequisite: One year of college history.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	4a	3	—	10	—	10	—	10	—	305 L. H.	Larson

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	4b	3	—	Schedule the same as for 4a (first semester).							

[9a-9b. The Renaissance and the Reformation.—The transition from medieval to modern ideals. *I, II; (3).* (Not given, 1917-18.)

Prerequisite: History 1a-1b.]

11. Special Topics in Ancient History.—Methods of research in Greek and Roman history. The decline of ancient civilization. *II; (3).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	11	3	—	11	—	11	—	11	—	205 L. H.	Oldfather

15. The Civil War and the Reconstruction.—The ante-bellum South and its destruction, 1844-1870. A study of the civil war in the light of the forces which tended to hasten or obstruct the clash of arms. *II; (3).*

Prerequisite: History 3a-3b.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	15	3	—	11	—	11	—	11	—	305 L. H.	Cole

16a-16b. The History of the Exploration and Colonization of the West.—First semester: the Mississippi Valley from the earliest European explorations to the close of the war of 1812. Second semester: the Mississippi Valley since 1815, and the progress of western expansion to the Pacific. (Either semester may be taken separately.) *I, II; (2).*

Prerequisite: History 3a-3b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	16a	2	—	—	10	—	10	—	—	305 L. H.	Alvord

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	16b	2	—	Schedule the same as for 16a (first semester).							

19. France in the Feudal and Later Middle Ages.—(A reading knowledge of French is desirable.) *II; (3).*

Prerequisite: History 1a-1b.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	19	3	—	—	2	—	2	—	—	311 L. H.	Jones

21. The Recent History of the United States.—Historical introduction to contemporary American politics. *I; (3).*

Prerequisite: History 3b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
History	21	3	—	—	9	—	9	—	—	305 L. H.	Robertson

23. England in the Seventeenth Century with Special Reference to the Puritan Revolution.—The influence of Puritanism on the institutions and ideals of modern England and America. *II; (2).*

Prerequisite: History 1a-1b or 2a-2b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	23	2	—	—	11	—	11	—	—	311 L. H.	Pease

24. European Consolidation and Colonial Expansion, 1648-1789.—I; (3).

Prerequisite: One year of college history, economics, or political science.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	24	3	—	9	—	9	—	9	—	305 L. H.	Lybyer

25. The French Revolution, Napoleon, and the European Reaction, 1789-1848.—II; (3).

Prerequisite: One year of college history, economics, or political science.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	25	3	—	9	—	9	—	9	—	305 L. H.	Lybyer

(Courses 24-25 and 20a-20b will ordinarily be given in alternate years.)

26. History of the Latin-American Colonies.—The political, economic, social, and intellectual life of Spain during the period of discovery. The exploration, settlement, and civilization of Spanish America and the Philippines. *I; (3).*

Prerequisite: History 1a-1b or 3a-3b.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	26	3	—	2	—	2	—	2	—	305 L. H.	Robertson

27. History of Latin-America from the War of Independence to the Present Time.—The national history of the leading Latin-American states with special attention to political parties, existing governments, and relations with Europe and the United States. A study of the old régime in Texas, Mexico, and California. *II; (3).*

Prerequisite: History 3a-3b.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	27	3	—	2	—	2	—	2	—	305 L. H.	Robertson

29. The Far East.—The contact of Western nations with the Far East from the sixteenth century to the present time. *II; (2).*

Prerequisite: One year of college history, economics, or political science, and senior standing.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	29	2	—	—	8	—	8	—	—	305 L. H.	Greene

31a-31b. The Mohammedan World.—First semester: Mohammed, the Saracen Empire, and the Moslem civilization, before the crusades. Second semester: the history and culture, since the first crusade, of the Mohammedan peoples in Europe, Africa, and Asia, except the Ottoman Turks. *I, II; (2).*

Prerequisite: One year of college history, economics, or political science, and senior standing.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	31a	2	—	—	8	—	8	—	—	311 L. H.	Lybyer

SECOND SEMESTER

History	31b	2	—	Schedule the same as for 31a (first semester).							
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(Courses 30 and 31 will ordinarily be given in alternate years.)

40. The Beginnings of the British Empire.—A study of the conditions that led to English expansion; the history of the empire; imperial institutions. *I; (2).*

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	40	2	—	—	10	—	10	—	—	311 L. H.	Larson

52. East and West in Ancient Times.—(Continuation of History 50.) The history of Persia, Parthia, and the Sassanids, to the Moslem conquest. The origins of the Eastern Question and the interrelation of East and West. *II*; (3).

Prerequisite: Junior standing, including History 5, 6, or 50.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	52	3	—	11	—	11	—	11	—	311 L. H.	Olmstead

53. Assyrian History.—A detailed history, based on the sources in translation, of the Assyrian Empire: the problems of the sources; the political thought; the government of dependencies; the parallels to more modern imperial states; and the economic life. *I*; (3).

Prerequisite: Senior standing and the consent of the instructor.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
History	53	3	—	8	—	8	—	8	—	305 L. H.	Olmstead

Courses for Graduates

Graduate work in history presupposes two years of college work in this subject, or sixteen semester hours, which should include courses in European and American history corresponding roughly to History 1a-1b and 3a-3b in this University. Linguistic preparation, especially in French and German, is important. For medieval history some knowledge of Latin is essential, and Spanish is useful for certain fields of American history.

Advanced courses in history at the University of Illinois are of three kinds:

(1) For information and guidance in general reading. (2) Instruction in methodology, historiography, and bibliography. A part of this work (in course 103) is required of all graduate students in history during their first year. (3) Seminar courses for the study of special fields with a view to training in the methods of historical criticism and research.

Illinois Historical Survey.—Students have an opportunity to pursue research in western history in connection with the Illinois Historical Survey, an organization for the purpose of carrying on systematic studies in the history of Illinois.

Attention is also called to the fact that the University of Illinois has for some time cooperated with the Trustees of the State Historical Library, in the gathering and editing of archive material. As a result instructors and graduate students in the department have contributed from time to time to the publications of the Library, and have been given useful training in the study of manuscript as well as printed material.

The Historical Club, consisting of graduate students in the department, which meets twice a month, gives an opportunity for informal discussion of historical topics.

101. Seminar in American History.—Bibliography; solution of typical problems, which will be chosen this year with special reference to the international relations of the United States; reports on the progress of investigations. *I, II*; (1 to 2 units).

In connection with this course, direction in research is offered as follows:

- | | |
|---------------------------------|---|
| A. American history before 1815 | Professor GREENE |
| B. American history since 1815 | Assistant Professor ROBERTSON, Dr. COLE |
| C. The history of the West | Professor ALVORD, Dr. PEASE |
| D. American church history | Professor GREENE |
| E. Latin-American history | Assistant Professor ROBERTSON |

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor	
				M	T	W	T	F			S
History	101	1 to 2 units	—	—	—	—	—	—	10,11	303 L. H.	Greene Alvord Robertson Cole Pease

102. Studies in English History.—Church and state in the medieval and early modern period; examination of documentary material. *Twice a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
History	102	1 unit	—	(Arrange)					303 L. H.	Larson

103. Historiography and Historical Method.—The technic of historical investigation. Required of all candidates for an advanced degree in history who do not present evidence of similar training elsewhere. *Twice a week; I; ($\frac{1}{2}$ unit).*

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
History	103	$\frac{1}{2}$ unit	—	—	11	—	11	—	303 L. H.	Cole

104. Seminar in English and Continental European History.—Studies in the expansion of Europe; bibliography, historiography, and selected problems; reports on researches. *I, II; (1 to 2 units).*

In connection with this course, direction in research is offered as follows:

- | | |
|---|------------------------------------|
| A. Medieval history | Professor LARSON |
| B. Modern history of Continental Europe | Professor LYBYER |
| C. English history | Professor LARSON |
| D. Renaissance and Reformation | Dr. JONES |
| E. Asiatic Relations | Professor GREENE, Professor LYBYER |

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor	
				M	T	W	T	F			
History	104	1 to 2 units	—	—	—	—	—	—	8,9	303 L. H.	Lybyer Larson Jones

105. Studies in the History of the West.—Subject for 1917-18: The French Colonization of the Mississippi Valley. *Once a week; I, II; (1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
History	105	1 unit	—	(Arrange)					303 L. H.	Alvord

111. Spanish-American Relations.—The relations of the Latin-American States with Europe and the United States. An intensive study of such topics as the Monroe Doctrine, the development of international trade, etc. *Once a week; I, II; ($\frac{1}{2}$ to 1 unit).*

Subject	No.	Credits	Section	BOTH SEMESTERS					Room	Instructor
				M	T	W	T	F		
History	111	$\frac{1}{2}$ to 1 unit	—	(Arrange)					303 L. H.	Robertson

Horticulture

112. Studies in American Religious History.—Questions of Church and State. *Twice a week; II; (1 unit).*

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
History	112 1 unit	—							303 L. H.	Greene

114. Studies in American Constitutional History.—Colonial institutions on the eve of the Revolution; the transition from provincial to republican governments; the genesis of the Federal Constitution; selected topics in the development of the Constitution since 1789. *I, II; (1 unit).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
History	114 1 unit	—	—	9	—	9	—	—	311 U. H.	Greene Robertson

150. Research in Ancient Oriental History.—*I, II; (1 unit).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
History	150 1 unit	—							303 L. H.	Olmstead

HORTICULTURE

JOSEPH CULLEN BLAIR, M.S., *Professor, Horticulture*
 JOHN WILLIAM LLOYD, Ph.D., *Professor, Olericulture*
 CHARLES SPENCER CRANDALL, M.S., *Professor, Pomology*
 CHARLES MULFORD ROBINSON, A.M., *Professor, Civic Design*
 HERMAN BERNARD DORNER, M.S., *Professor, Floriculture*
 BETHEL STEWART PICKETT, M.S., *Professor, Pomology*
 RALPH RODNEY ROOT, M.L.A., *Assistant Professor, Landscape Gardening*
 ERNEST WINFIELD BAILEY, M.S., *Assistant Professor, Pomology*
 CHARLES ELMER DURST, M.S., *Assistant Professor, Olericulture*
 FREDERICK NOBLE EVANS, M.L.A., *Assistant Professor, Landscape Design*
 WARREN ALBERT RUTH, A.M., *Associate, Horticultural Chemistry*
 SIMEON JAMES BOLE, A.M., *Associate, Pomology*
 FRED WEAVER MUNCIE, Ph.D., *Associate, Plant Nutrition*
 HARRY WARREN ANDERSON, Ph.D., *Associate, Pomology*
 PHILIP AUGUSTUS LEHENBAUER, Ph.D., *Associate, Plant Physiology*
 DUANE TAYLOR ENGLIS, Ph.D., *Associate, Plant Nutrition*
 ALFRED JOSEPH GUNDERSON, B.S., *Associate, Pomology*
 TELL WILLIAM NICOLET, M.L.A., *Associate, Landscape Gardening*
 WILLIAM SANFORD BROCK, A.B., B.S., *Instructor, Pomology*
 ARTHUR SAMUEL COLBY, M.S., *Instructor, Pomology*
 AUGUST GEORGE HECHT, B.S., *Instructor, Floriculture*
 HOWARD DEXTER BROWN, B.S., *Assistant, Olericulture*
 EDWARD GEORGE LAUTERBACH, B.S., *Assistant, Floricultural Pathology*
 HARRY WARREN DAY, B.S., *Assistant, Olericulture*
 JAMES HUTCHINSON, *Assistant, Floriculture*
 WALTER PAVY JAMES, B.S., *Assistant, Pomology*

1a. Elements of Horticulture.—Fruit growing, vegetable gardening, and ornamental planting, with special reference to the farm home. Required of all freshmen in the General Curriculum in Agriculture. Recitations; practical exercises. *A student is required to register in the same section for both laboratory and quiz. I; (2).*

FIRST SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Horticulture	1a	2 A, Quiz	10	—	10	—	—	—	301 Ag.
		Laboratory ¹	—	1,2	—	—	—	—	
		B, Quiz	11	—	11	—	—	—	301 Ag.
		Laboratory ¹	—	8,9	—	—	—	—	Gunderson
		C, Quiz	11	—	11	—	—	—	122 Ag.
		Laboratory ¹	—	—	—	8,9	—	—	
		D, Quiz	—	10	—	10	—	—	301 Ag.
		Laboratory ¹	1,2	—	—	—	—	—	
		E, Quiz	—	11	—	11	—	—	301 Ag.
		Laboratory ¹	8,9	—	—	—	—	—	Pickett
		F, Quiz	—	3	—	3	—	—	301 Ag.
		Laboratory ¹	—	—	—	—	8,9	—	Brock
		G, Quiz	—	3	—	3	—	—	122 Ag.
		Laboratory ¹	—	—	—	—	1,2	—	Colby
		H, Quiz	—	3	—	3	—	—	553 Ag.
		Laboratory ¹	—	—	—	—	—	8,9	Ruth

1b. Elements of Horticulture.—(A continuation of Horticulture 1a.) Required of all freshmen in the General Curriculum in Agriculture. *A student is required to register in the same section for both laboratory and quiz.* II; (2).

The instructors remain the same as for 1a until March 1, when the following arrangements go into effect:

SECOND SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Horticulture	1b	2 A, Quiz	10	—	10	—	—	—	301 Ag.
		Laboratory ¹	—	1,2	—	—	—	—	
		B, Quiz	11	—	11	—	—	—	301 Ag.
		Laboratory ¹	—	8,9	—	—	—	—	
		C, Quiz	11	—	11	—	—	—	122 Ag.
		Laboratory ¹	—	—	—	8,9	—	—	
		D, Quiz	—	10	—	10	—	—	301 Ag.
		Laboratory ¹	1,2	—	—	—	—	—	Day
		E, Quiz	—	11	—	11	—	—	301 Ag.
		Laboratory ¹	8,9	—	—	—	—	—	Durst
		F, Quiz	—	3	—	3	—	—	301 Ag.
		Laboratory ¹	—	—	—	—	8,9	—	Brown
		G, Quiz	—	3	—	3	—	—	122 Ag.
		Laboratory ¹	—	—	—	—	1,2	—	Lloyd
		H, Quiz	—	3	—	3	—	—	128 Ag.
		Laboratory ¹	—	—	—	—	—	8,9	Day

2. Small Fruits and Grapes.—The grape, strawberry, raspberry, blackberry, dewberry, currant, gooseberry. History; extent of cultivation; soil; location; fertilizers; propagation; planting; tillage; pruning; insect enemies; diseases; varieties; harvesting; marketing. Lectures; reference readings; laboratory. II; (3).

Prerequisite: Horticulture 1a.

SECOND SEMESTER									
Subject	No. Credits	Section	M	T	W	T	F	S	Room
Horticulture	2	3 Lecture	11	—	11	—	11	—	455 Ag.
		Laboratory	—	—	—	—	—	10,11	

Instructor
Bole

3. Commercial Vegetable Gardening.—The production and marketing of vegetables on a commercial scale. Lectures; reference readings; practical experience in the department greenhouses and gardens. II; (5).

Prerequisite: Horticulture 1a and 1b or their equivalent.

¹All laboratory sections meet in Vegetable Greenhouse.

Horticulture

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	3	5	Lecture	3	—	3	—	3	—	V. G.	Durst
			Laboratory	—	3,4	—	3,4	—	8,9	V. G.	Durst Brown

4. Plant Houses.—Construction, cost, and maintenance; heating; ventilating. *II*; (4).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	4	4	Lecture	3	3	3	3	—	—	F. G.	Dorner
			Quiz	—	—	—	—	3	—	F. G.	Dorner

5. Plant Propagation.—Grafts; buds; layers; cuttings; seeds. Lectures; laboratory; quizzes. *I*; (5).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	5	5	Lecture	—	1	—	1	—	—	F. G.	Dorner
			A, Quiz	1	—	—	—	—	—	F. G.	Lauterbach
			B, Quiz	2	—	—	—	—	—	F. G.	Dorner
			C, Quiz	3	—	—	—	—	—	F. G.	Lauterbach
			A, Laboratory	—	—	1,2	—	1,2	—	F. G.	Dorner
			B, Laboratory	—	2,3	—	2,3	—	—	F. G.	Lauterbach

6. Nursery Methods.—Some details of the nursery business; propagation, management, etc., and their relation to horticulture in general. Lectures; reference readings. Trips will be taken to nurseries, the cost not to exceed \$10.00. *II*; (2).

Prerequisite: Horticulture 5.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	6	2	—	—	1,2	—	1,2	—	—	301 Ag.	Bailey

7. Spraying.—Materials, appliances, and methods employed in combating insects and fungous diseases. Lectures; reference readings; laboratory; field work. *II*; (3).

Prerequisite: Horticulture 1a and 1b or their equivalents; Chemistry 1; Entomology 4.

SECOND SEMESTER											
Subject	No. Credits		Section	M	T	W	T	F	S	Room	Instructor
Horticulture	7	3	Lecture	—	—	1	—	—	—	H. B.	Ruth, Brock
			Quiz	—	—	2	—	—	—	H. B.	Ruth, Brock
			Laboratory	1,2	—	—	—	1,2	—	H. B.	Ruth, Brock

[9. Forestry.—Forest trees; uses; distribution; artificial production; relations of forest and climate; forestry legislation and economy. *II*; (2). (Not given, 1917-18.)

Prerequisite: Botany 1, or its equivalent.]

10a. Rural Improvement.—Landscape gardening in the open country and its relation to rural conditions, with special reference to the farm group. Lectures; reference readings; reports. *I*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	10a	2	Lecture	—	11	—	11	—	—	228 N. H.	Root

10b. Town Improvement.—The development of the town as an organism and the improvement of small communities, with special reference to the home grounds. Lectures; reference readings; reports; occasional field trips. *II*; (2).

SECOND SEMESTER										Room	Instructor
Subject	No. Credits	Section	M	T	W	T	F	S			
Horticulture	10b	2 Lecture	—	11	—	11	—	—		128 Ag.	Evans

11. Study of Cultivated Plants.—The relationship and classification of economic and ornamental plants of the temperate zone; identification of species; examination of living plants and herbarium specimens. Lectures; assigned readings. *I*; (2).

Prerequisite: Botany 4a.

FIRST SEMESTER										Room	Instructor
Subject	No. Credits	Section	M	T	W	T	F	S			
Horticulture	11	2	—	2	—	2	—	—		301 Ag.	Blair Crandall

15a. Principles of Plant Growing.—Preparation of soils for greenhouse crops; fertilizers; potting and shifting plants; watering. Lectures; practical greenhouse work. *II*; (5).

Prerequisite: Horticulture 5; Botany 1.

SECOND SEMESTER										Room	Instructor
Subject	No. Credits	Section	M	T	W	T	F	S			
Horticulture	15a	5 Lecture	—	10	—	10	—	—		F. G.	Dorner
		Laboratory	10,11	—	10,11	—	10,11	—		F. G.	Dorner Hecht

15b. Commercial Crops.—Greenhouse plants and cut flowers for wholesale and retail markets; care and marketing of the crops. Lectures; greenhouse work. *I*; (5).

Prerequisite: Horticulture 15a.

FIRST SEMESTER										Room	Instructor
Subject	No. Credits	Section	M	T	W	T	F	S			
Horticulture	15b	5 Lecture	—	9	—	9	—	—		F. G.	Hecht
		Laboratory	8,9	—	8,9	—	8,9	—		F. G.	Hecht

19. Amateur Floriculture.—Window gardening; growing of flowers on the home grounds; containers; potting soils; fertilizers; preparation and planting of flower beds; propagation and culture of plants for window and garden. *I*; (3).

FIRST SEMESTER										Room	Instructor
Subject	No. Credits	Section	M	T	W	T	F	S			
Horticulture	19	3	9	—	9	—	9	—		F. G.	Lauterbach

21a. Landscape Design (Sophomore Course).—Simple composition as applied to landscape design; types of drafting and presentation used in office practise. *I*; (4).

Prerequisite: Architecture 32.

FIRST SEMESTER										Room	Instructor
Subject	No. Credits	Section	M	T	W	T	F	S			
Horticulture	21a	4 Lecture	2	—	—	—	—	—		301 Ag.	Nicolet
		Laboratory				(Arrange)				307 Ag.	Nicolet

21b. Landscape Design (Sophomore Course).—Small private estates and gardens in city and suburban developments. *II*; (4).

Prerequisite: Horticulture 21a.

SECOND SEMESTER										Room	Instructor
Subject	No. Credits	Section	M	T	W	T	F	S			
Horticulture	21b	4 Lecture	2	—	—	—	—	—		301 Ag.	Nicolet
		Laboratory				(Arrange)				307 Ag.	Nicolet

Horticulture

23a-23b. Landscape Design (Junior Course).—Landscape design as applied to country estates, playgrounds, golf courses, and parks. Drafting; field trips; assigned readings; reports; occasional lectures. *I, II*; (4).

Prerequisite: Horticulture 21b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture 23a	4		Lecture	—	—	2	—	—	—	301 Ag.	Root
			Laboratory			(Arrange)				307 Ag.	Root
Horticulture 23b	4		Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			Lecture	—	—	—	—	10	—	301 Ag.	Root
			Laboratory			(Arrange)				307 Ag.	Root

24a. Trees and Shrubs.—Identification and characteristics of hardy plant material used in landscape gardening. Lectures; reference readings; field trips. *II*; (3).

Prerequisite: Botany 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture 24a	3		Lecture	3	—	3	—	3	—	301 Ag.	Root Nicolet

24b. Trees and Shrubs.—(Continuation of Horticulture 24a.) Lectures; reference readings; field trips. *I*; (3).

Prerequisite: Horticulture 24a.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture 24b	3		Lecture	3	—	3	—	3	—	301 Ag.	Root Nicolet

25a-25b. Advanced Landscape Design (Senior Course).—Drafting; field trips; assigned readings; reports; occasional lectures; 15 hours' drafting per week. *I, II*; (5).

Prerequisite: Horticulture 23b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture 25a	5		Lecture	—	—	—	—	2	—	306 Ag.	Evans
			Laboratory			(Arrange)				307 Ag.	Evans
Horticulture 25b	5		Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			Lecture	—	—	—	—	2	—	306 Ag.	Evans
			Laboratory			(Arrange)				307 Ag.	Evans

26a. Planting Design (First Course).—The planting of private estates and gardens. Problems based on those worked out in courses 21b and 23b. Planting; lectures; drafting; reference readings; field trips; planting specifications; reports. Six hours' drafting; one lecture. *II*; (3).

Prerequisite: Horticulture 23a, 24b.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture 26a	3		Lecture	—	—	—	—	11	—	301 Ag.	Nicolet
			Laboratory			(Arrange)				307 Ag.	Nicolet

26b. Planting Design (Second Course).—The planting of public properties, parks, golf courses, cemeteries. Problems based on those worked out in courses 23b and 25. Lectures; drafting; conferences. Six hours' drafting; one lecture. *I*; (3).

Prerequisite: Horticulture 26a.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture 26b	3		Lecture	—	—	—	—	11	—	301 Ag.	Evans
			Laboratory			(Arrange)				307 Ag.	Evans

27a-27b. Landscape Construction.—The preparation of construction drawings such as grading plans, working drawings, specifications, and reports. *I, II; (3).*

Prerequisite: Civil Engineering 32.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Horticulture	27a	3	Lecture	—	—	—	10	—	—	303 Ag.
			Laboratory				(Arrange)			307 Ag.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Horticulture	27b	3	Lecture	10	—	10	—	—	—	553 Ag.
			Laboratory				(Arrange)			301 Ag.

28. Exotics.—Decorative plants used in landscape gardening. Lectures; planting plans; field trips. *II; (1).*

Prerequisite: Horticulture 23b, 24b.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Horticulture	28	1	Lecture	—	3	—	—	—	—	306 Ag.
			Laboratory				(Arrange)			307 Ag.

29a. Garden Design.—The garden in its relation to the house; architectural harmony, utilization, topographic conditions, and planting for architectural or horticultural emphasis. Eight hours' drafting; one lecture. *I; (3).*

Prerequisite: Architecture 32.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Horticulture	29a	3	Lecture	—	—	—	—	11	—	303 Ag.
			Laboratory				(Arrange)			307 Ag.

29b. Garden Design.—The designing of period gardens and their relation to garden design. Eight hours' drafting; one lecture. *II; (3).*

Prerequisite: Horticulture 23a or Architecture 33.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Horticulture	29b	3	Lecture	—	—	9	—	—	—	455 Ag.
			Laboratory				(Arrange)			307 Ag.

30. Decorative and Bedding Plants.—Tropical and sub-tropical plants used in decorative work in the conservatory; tender plants used in out-door bedding. Lectures; practical greenhouse work. *II; (5).*

Prerequisite: Horticulture 15a.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Horticulture	30	5	Lecture	—	9	—	9	—	—	F. G.
			Laboratory	8,9	—	8,9	—	8,9	—	F. G.

31. Garden Flowers.—The propagation and growing of annuals, herbaceous perennials, bulbs, and shrubs for cut flowers and ornamental plantings. *II; (3).*

Prerequisite: Horticulture 5; Botany 1.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Horticulture	31	3	Lecture	1	—	1	—	1	—	F. G.
			Laboratory				(Arrange)			F. G.

32a. Floral Decoration.—Cut flowers and plants in decorative work; arrangement of flowers in baskets, designs, and bouquets; table decoration; house decoration. (For floricultural students.) *I; (3).*

Horticulture

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	32a	3	Lecture	3	—	3	—	3	—	F. G.	Dorner
			Laboratory	—	—	—	—	—	8-11	F. G.	Dorner

32b. Floral Decoration.—(Continuation of Horticulture 32a.) *II*; (3).

Prerequisite: Horticulture 32a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	32b	3	Lecture	3	—	3	—	3	—	F. G.	Dorner
			Laboratory	—	—	—	—	—	8-11	F. G.	Dorner

33. Systematic Pomology.—Description, nomenclature, and classification of native and sub-tropical fruits; critical descriptions and identification with special reference to relationships and classifications of varieties. Training is given in judging and displaying fruits. (For students specializing in pomology.) *I*; (2).

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	33	2	—	—	1,2	—	1,2	—	—	108 Ag.	Bailey

34. Vegetables under Glass.—Types of greenhouses for vegetable forcing; soils; fertilizers; treatment of insects and diseases; management problems; marketing; detailed study of the principal forcing crops. Lectures; reference readings; practical laboratory work. *I*; (3).

Prerequisite: Horticulture 3.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	34	3	—	1,2	—	1,2	—	1,2	—	V. G.	Durst Brown

35. Private Conservatory Work.—Types of plants for large conservatories; arrangement; care. *II*; (3).

Prerequisite: Horticulture 15a, 4.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	35	3	—	—	—	—	—	—	—	F. G.	Dorner

36. History of Landscape Gardening.—Lectures; reference readings; library sketches; reports. *II*; (2).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	36	2	—	—	11	—	11	—	—	308 Ag.	Root

37a. Civic Design.—Town remodeling; remedial problems in town planning. Lectures; field trips; reference readings; reports; drafting. *I*; (3).

Prerequisite: Horticulture 41 or Political Science 4 or 34.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	37a	3	Lecture	—	—	—	—	—	—	306-B Ag.	Robinson

37b. Civic Design.—Town extension; preventive and preservative aspects of town planning. Lectures; reference readings; drafting; textbook. *II*; (3).

Prerequisite: Horticulture 37a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	37b	3	Lecture	—	—	—	—	—	—	306-B Ag.	Robinson
			Laboratory	—	—	—	—	—	—	—	Evans

38a. Office Practise in Landscape Gardening.—Actual practise in the carrying out of landscape plans in the field. Lectures; office work; reports. *I*; (2).

Prerequisite: Horticulture 27b, 23b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	38a	2	Lecture	9	—	—	—	9	—	303 Ag.	Root
			Laboratory				(Arrange)				Root

38b. Office Practise in Landscape Gardening.—Legislation authorizing and promoting the ends of city planning. Contracts and specifications. Lectures; reference readings; textbook. *II*; (2).

Prerequisite: Horticulture 37a and 38a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	38b	2	Lecture	9	—	—	—	9	—	303 Ag.	Robinson Evans

39a-39b. Special Lectures.—Lectures by members of the faculty and invited lecturers, on the working out of problems in landscape gardening. Certain inspection trips will be required of the class. The expense of these trips will be about \$2.00. One lecture a week with written reports. (Professional students are required to register in this course each semester of each year.) *I, II*; (1).

Prerequisite: Permission of the instructor in charge.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	39a	1	—	—	—	—	3	—	—	308 Ag.	Root Evans Nicolet
Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	39b	1	—	—	—	—	3	—	—	308 Ag.	Root Evans Nicolet

40a. Trees and Shrubs (Advanced Course).—Composition as applied to the use of plant material in landscape gardening, with practise in pencil and wash drawing. Assigned readings; drafting. *I*; (3).

Prerequisite: Horticulture 24b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	40a	3	Lecture	—	1	—	1	—	—	306 Ag.	Evans
			Laboratory				(Arrange)			306 Ag.	Evans

40b. Trees and Shrubs (Advanced Course).—Landscape forestry as applied to private estates, parks, and city planting. *II*; (3).

Prerequisite: Horticulture 24b.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	40b	3	Lecture	—	1	—	1	—	—	306 Ag.	Root
			Laboratory				(Arrange)			306 Ag.	Root

41. Civic Design (Elementary Course).—Lectures introductory to city planning; reference readings; reports. *II*; (1).

Prerequisites: Horticulture 23a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Horticulture	41	1	—	8	—	—	—	—	—	553 Ag.	Robinson Evans

Horticulture

42. Landscape Design (Elementary Course for Non-professional Students).—

The planning and planting of home grounds. Lectures; reference readings; reports; six hours' drafting per week. *II*; (3).

Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Horticulture	42	3	Lecture	—	—	—	1	—	—		208 Ag.	Nicolet
			Laboratory				(Arrange)				208 Ag.	Nicolet

Courses for Advanced Undergraduates and Graduates

8. **Orcharding.**—Pomaceous, drupaceous, and nut fruits; management of large commercial orchards; harvesting; grading; packing; storing; marketing. *I*; (5).

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Horticulture	8	5	—	10	10,11	10	10,11	10	—		V. G.	Bailey

12. **Evolution of Horticultural Plants.**—History, botanical classification, and geographical distribution of cultivated plants; modification under culture; theoretical causes and observed factors that influence variation, particularly food supply, climate, and cross-fertilization. *I*; (3).

Prerequisite: Two years of university work; Horticulture 8 and Botany 4a.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Horticulture	12	3	—	11	—	11	—	11	—		308 Ag.	Crandall

17. **Commercial Orchardling.**—(Continuation of Horticulture 8.) Practical work in orchards and fruit plantations; orchard management; reference readings; seminar. A limited number of trips will be taken, cost not to exceed \$10.00. For students specializing in pomology. *II*; (5).

Prerequisite: Horticulture 8 or its equivalent.

Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Horticulture	17	5	—	8,9	9	8,9	9	8,9	8,9		V. G.	Bailey

18. **Experimental Horticulture.**—Methods and difficulties in horticultural investigations; the planning of experiments; recording and interpretation of results. For advanced students preparing for experiment station work. *II*; (5).

Prerequisite: Twenty hours' work in horticulture.

Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Horticulture	18	5	Lecture	10	—	10	—	10	—		122 Ag.	Blair
			Laboratory				(Arrange)				—	Pickett
												Blair
												Pickett

22a-22b. **Thesis and Investigation.**—Special training in the investigation of horticultural problems. (Thesis not required for 22b.) *I, II*; (5-10).¹

Prerequisite: Senior standing; permission of the head of the department.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Horticulture	22a	5-10 ¹	—				(Arrange)				—	—
Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Horticulture	22b	5-10 ¹	—				(Arrange)				—	—

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

43. Greenhouse Fertilizers.—Soils and fertilizers; moisture and carbon dioxide content of the air; temperature as related to greenhouse crops. Lectures; seminar. *I*; (3).

Prerequisite: Botany 27a; Agronomy 9; Horticulture 3 or 15a.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Horticulture	43	3	Lecture	—	—	11	—	11	—	F. G.	—
			Quiz	11	—	—	—	—	—	F. G.	—

44. Pomology Seminar.—Assigned topics; review of books, current technical journals, and other publications. For seniors and graduates specializing in pomology. *I* or *II*; ($\frac{1}{2}$).

EITHER SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Horticulture	44	$\frac{1}{2}$	—				(Arrange)			412 U. H.	Pickett Bailey

45. Plant Nutrition.—Carbohydrates, proteins, organic acids, and other organic compounds of plants and their relation to plant nutrition. Lectures; laboratory. *I, II*; (5).

Prerequisite: Botany 1; Chemistry 13a; Chemistry 14a-14b and 9a, or 9 and 9c, if not being carried at the same time.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Horticulture	45a	5	—				(Arrange)			—	Muncie Englis
SECOND SEMESTER											
Horticulture	45b	5	—				(Arrange)			—	

46. Marketing Horticultural Products.—A study of fundamental principles involved in the successful marketing of fruits and vegetables. For seniors and graduates specializing in horticulture. *I*; (2).

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Horticulture	46	2	—				(Arrange)			—	Lloyd

Courses for Graduates

At least two years of collegiate work in horticulture and allied subjects and specific preparation for the chosen topics are required for entrance on major work in this department.

103. Olericulture.—Horticultural relationships, origins, breeding, fertilizing, cultural requirements, and improvement of vegetables. Conferences. *I, II*; (1 to 2 units; a student working part time and extending his study for the master's degree over two years may register $\frac{1}{2}$ to 1 unit for each of the four semesters). Time to be arranged.
Professor BLAIR, Professor LLOYD

108. Pomology.—Special problems in the relationship, adaptation, improvement, propagation, cultivation, pruning, protection, preservation, or marketing of small fruits and orchard fruits. Conferences. *I, II*; (1 to 2 units; a student working part time and extending his study for the master's degree over two years may register for $\frac{1}{2}$ to 1 unit for each of the four semesters). Time to be arranged.

Professor BLAIR, Professor CRANDALL, Professor LLOYD, Professor PICKETT

Household Science

115. Floriculture.—The horticultural status of flowering plants, or special problems in the culture of greenhouse plants. *I, II; (1 to 2 units). Time to be arranged.* Professor DORNER

116. Chemistry of Plant Nutrition.—Research course following Horticulture 45. Lectures; seminar; laboratory. *I, II; (¾ to 1¼ units). Time to be arranged.* Dr. MUNCIE

HOUSEHOLD SCIENCE

ISABEL BEVIER, Ph.M., *Professor and Director*
 RUTH WHEELER, Ph.D., *Assistant Professor*
 CORA EMELINE GRAY, M.S., *Associate*
 MAUD EDNA PARSONS, A.B., *Associate*
 LORINDA PERRY, Ph.D., *Associate*
 LUCILE WHEELER, A.M., *Associate*
 LEONA HOPE, *Associate*
 MARY C DEGARMO, A.M., *Instructor*
 JEAN GILBERT MACKINNON, A.M., *Instructor*
 GEORGIA ELIZABETH FLEMING, B.S., *Instructor*
 VIOLA JENNIE ANDERSON, M.S., *Instructor*
 FLORENCE HELEN CHURTON, B.S., *Instructor*
 SARAH AUGUSTA SUTHERLAND, B.S., *Instructor*
 MARIE E FREEMAN, A.B., *Assistant*
 MADGE LAMOREAUX, B.S., *Assistant*
 MRS. JOSEPHINE KERR ALLISON, M.S., *Assistant*

Major: 20 hours from any courses offered by the department, excluding Household Science 2 and 7, and including Household Science 3, 5, 6, and 12. To satisfy the requirement for the Major, students transferring from other institutions must take at least one of the following: 4, 5, 11, 17, 18.

Minors: 20 hours from either (a) chemistry, bacteriology, and physiology; or (b) economics (a minimum of eight hours), with one or two of the following subjects: art and design, education, history, psychology, and sociology.

1. Selection and Preparation of Food.—The nature and uses of foods, their chemical composition, and the changes effected by heat, cold, or fermentation; principles of selection, illustrated by marketing expeditions; processes of manufacture; combinations of different kinds. *II; (3).*

Prerequisite: Entrance credit in physics; Chemistry 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	1	3	Lecture	—	—	—	11	—	—	113 W. B.	L. Wheeler MacKinnon Anderson
			A1 Laboratory	10,11	—	10,11	—	—	—	235 W. B.	
			A2 Laboratory	10,11	—	10,11	—	—	—	Basement	
			B1 Laboratory	2,3	—	2,3	—	—	—	235 W. B.	
			B2 Laboratory	2,3	—	2,3	—	—	—	Basement	
			B3 Laboratory	2,3	—	2,3	—	—	—	227 W. B.	
			C1 Laboratory	—	8,9	—	8,9	—	—	235 W. B.	
			C2 Laboratory	—	8,9	—	8,9	—	—	Basement	
			D1 Laboratory	—	2,3	—	2,3	—	—	235 W. B.	
			D2 Laboratory	—	2,3	—	2,3	—	—	Basement	
			A Quiz	—	—	—	—	8	—	121 W. B.	
			B1 Quiz	—	—	—	—	10	—	117 W. B.	
			B2 Quiz	—	—	—	—	10	—	121 W. B.	
			C1 Quiz	—	—	—	—	2	—	113 W. B.	
			C2 Quiz	—	—	—	—	2	—	117 W. B.	
			D Quiz	—	—	—	—	3	—	121 W. B.	

2. Home Architecture and Sanitation.—Situation, surroundings, and construction of the house; hygiene, heating, lighting, ventilation, water supply, and drainage. House planning and sanitary plumbing, fixtures, and internal drainage; making skeleton plans. *I*; (2).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	2	2	Lecture	—	9	—	—	—	9	113 W. B.	} Bevier Fleming Hope Clark Ash
			A1 Quiz	—	—	—	8	—	—	121 W. B.	
			A2 Quiz	—	—	—	8	—	—	117 W. B.	
			B1 Quiz	—	—	—	9	—	—	309 W. B.	
			B2 Quiz	—	—	—	9	—	—	117 W. B.	
			B3 Quiz	—	—	—	9	—	—	121 W. B.	
			C1 Quiz	—	—	—	3	—	—	121 W. B.	

3. Elementary Home Decoration.—Evolution of the house and home; homes of primitive peoples; theory of color and its application in home decoration; furnishings from a sanitary and artistic standpoint. *II*; (3).

Prerequisite: Art and Design 12; Household Science 2; junior standing.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	3	3	—	—	9	—	9	—	—	113 W. B.	Bevier Hope Perry

4. Food and Nutrition.—Physiological, chemical, and bacteriological problems of food and nutrition. Individual investigation. *I*; (5).

Prerequisite: Bacteriology 5; Chemistry 13a, 9, 9c; Household Science 5.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	4	5	Lecture	8	—	—	—	—	—	117 W. B.	R. Wheeler
			Discussion	—	—	—	—	8	—	117 W. B.	R. Wheeler
			Laboratory	—	8,9	8,9	8,9	—	—	215 W. B.	R. Wheeler

5. Dietetics.—Diet; the relation of food to health; influence of age, sex, and occupation on diet; the construction of dietaries; dietetic treatment of certain diseases. Laboratory. *I* or *II*; (3).

Prerequisite: Household Science 1, 6; Physiology 4.

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Household Science	5	3	Lecture	—	—	—	10	—	—	113 W. B.	deGarmo
			A Laboratory	10,11	—	—	—	—	—	229 W. B.	deGarmo
			B Laboratory	—	—	—	1,2	—	—	229 W. B.	deGarmo
			C Laboratory	—	—	—	—	10,11	—	229 W. B.	deGarmo
			A Quiz	—	10	—	—	—	—	117 W. B.	deGarmo
			B Quiz	—	11	—	—	—	—	117 W. B.	deGarmo

6. Economic Uses of Food.—(Continuation of Household Science 1.) The economics of the food question; uses and applications of preservatives. *I*; (4).

Prerequisite: Household Science 1; credit or concurrent registration in Chemistry 2a.

Household Science

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	6	4	Lecture	—	—	—	11	—	—	113 W. B.	MacKinnon L. Wheeler Anderson Churton
			A1 Laboratory	10,11	—	10,11	—	—	—	235 W. B.	
			A2 Laboratory	10,11	—	10,11	—	—	—	Basement	
			B1 Laboratory	2,3	—	2,3	—	—	—	235 W. B.	
			B2 Laboratory	2,3	—	2,3	—	—	—	Basement	
			C1 Laboratory	—	8,9	—	8,9	—	—	235 W. B.	
			C2 Laboratory	—	8,9	—	8,9	—	—	Basement	
			D Laboratory	—	2,3	—	2,3	—	—	235 W. B.	
			A Quiz	—	—	—	—	8	—	121 W. B.	
			B1 Quiz	—	—	—	—	10	—	117 W. B.	
			B2 Quiz	—	—	—	—	10	—	121 W. B.	
			C1 Quiz	—	—	—	—	2	—	117 W. B.	
			C2 Quiz	—	—	—	—	2	—	113 W. B.	
			D Quiz	—	—	—	—	3	—	121 W. B.	

7. Textiles.—Development of the textile industry from primitive times to the present; the important fibers and materials made from them; movements for bettering textile conditions. *I* or *II*; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	7	2	Lecture	—	10	—	—	—	—	113 W. B.	Sutherland
			A Quiz	3	—	—	—	—	—	117 W. B.	
			B Quiz	—	—	3	—	—	—	117 W. B.	
			C Quiz	—	—	—	10	—	—	117 W. B.	
			D Quiz	—	—	—	3	—	—	117 W. B.	
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
				—	11	—	—	—	—	113 W. B.	
				—	—	—	11	—	—	117 W. B.	
				—	—	—	1	—	—	117 W. B.	
				—	—	—	2	—	—	117 W. B.	

9. Individual Problems.—Different phases of home economics. *II*; (3).

Prerequisite: Senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	9	3	—	2	—	2	—	2	—	117 W. B.	Bevier

10. Household Management.—Expenditure of the income; organization of the household; care of the house and family; home nursing; the domestic service problem. Laboratory work in practise apartment. *I* or *II*; (2).

Prerequisite: Household Science 1, 2, 6; Economics 1 or 2.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	10	2	—	—	11	—	11	—	—	121	Gray Allison
			Laboratory				(Arrange)				

11.¹ Teachers' Course.—The best methods of presenting the work, and its correlation with other subjects. Practise in planning and presenting courses. Two inspection trips are made to other schools, one in April and one in May. The total cost does not exceed \$5.00. *II*; (3).

Prerequisite: Household Science 5, 12, and 13; laboratory work in sewing first semester; senior standing.

¹Millinery for those taking Household Science 11 is given from 10 to 12 o'clock on Saturday the second semester, and sewing from 2 to 4 o'clock Tuesday or 10 to 12 o'clock Saturday the first semester.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	11	3	—	—	3	—	3	—	—	113 W. B.	Bevier Churton Sutherland

12. Clothing.—(Continuation of Household Science 19.) Demonstrations and laboratory work in drafting, cutting, fitting, and making of garments from designs prepared in Household Science 19. *II*; (3).

Prerequisite: Household Science 19. Proof of ability to do plain sewing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	12	3	A Laboratory	8,9	—	8,9	—	8,9	—	327 W. B.	Fleming Lamoreaux
			B Laboratory	10,11	—	10,11	—	10,11	—	203 W. B.	
			C1 Laboratory	1,2	—	1,2	—	1,2	—	203 W. B.	
			C2 Laboratory	1,2	—	1,2	—	1,2	—	327 W. B.	
			D Laboratory	—	10,11	—	10,11	—	10,11	327 W. B.	

13. History of Home Economics.—The development of home economics as one of the factors in the education of women; the work in different types of institutions; the planning of courses for these types. *I*; (2).

Prerequisite: Senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	13	2	—	—	—	3	—	3	—	113 W. B.	Bevier Churton

14. Problems in the Preparation and Service of Food.—Preparation and serving of meals for a family with particular reference to cost; individual problems in the manipulation of food materials; kitchen and dining room equipment. *I* or *II*; (3).

Prerequisite: Household Science 6, 10, and consent of the instructor; credit or concurrent registration in Household Science 5.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	14	3	A Laboratory	8,9	—	8,9	—	8,9	—	227, 117 W. B.	Gray
			B Laboratory	8,9	—	8,9	—	8,9	—	227, 117 W. B.	Allison

15. Economics of the Family Group.—Brief history of the family with special reference to the development of the household; consumption of wealth; family income; family expenditures; interdependence of the family and the community. *I* or *II*; (3).

Prerequisite: Household Science 3, 5, 12; Economics 1 or 2.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	15	3	—	8	—	8	—	8	—	121 W. B.	Perry

17. Problems in the Study of Textiles.—Microscopic and chemical analysis of fabrics; dyeing; special problems. *II*; (3).

Prerequisite: Household Science 7, 12; Chemistry 1, 2a.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	17	3	Lecture	3	—	—	—	—	—	117 W. B.	MacKinnon
			Laboratory	—	—	2,3	—	2,3	—	215 W. B.	MacKinnon

18. Lunch Room Management.—Organization and equipment of lunch rooms. Laboratory practise. The class takes a trip to Chicago to inspect various types of lunch rooms. The cost of the trip is about \$15.00. *I* or *II*; (5).

Prerequisite: Household Science 5; Economics 1 or 2; senior standing.

Household Science

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	18	5	Lecture	—	—	1	—	—	—	117 W. B.	Parsons
			Lecture and Quiz					(Arrange)		—	Freeman
			Laboratory, two consecutive 3-hr. periods.					(Arrange)			

19. Dress Design.—Study of dress from artistic, historic, economic, and hygienic standpoints. Application of principles of design to silhouette, proportion, line, and color. *I*; (3).

Prerequisite: Art and Design 1, 12; Household Science 7.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	19	3	Lecture	—	—	1	—	—	—	113 W. B.	Hope
			A Laboratory	8,9	—	8,9	—	—	—	309 W. B.	Hope
			B Laboratory	1,2	—	—	—	1,2	—	309 W. B.	Hope
			C Laboratory	—	10,11	—	10,11	—	—	309 W. B.	Hope
			D Laboratory	—	1,2	—	1,2	—	—	309 W. B.	Hope

20. Infant Nutrition.—Lectures; readings; discussions. *II*; (2).

Prerequisite: Household Science 4; senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	20	2	—	—	2	—	2	—	—	121 W. B.	R. Wheeler

21. Weaving.—Application of the principles of design to weaving. Lectures; laboratory. *I* or *II*; (1).

Prerequisite: Art and Design 1, 12; Household Science 7.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	21	1	—	—	—	—	8,9,10	—	—	219 W. B.	Lamoreaux

[22. Theory of Form and Color.—Importance of value and intensity; analogous and contrasted harmony; keying; balance; study of plant forms and textiles. *I*; (3). (Not given, 1917-18.)

Prerequisite: Architecture 23.]

[23. Theory of Form and Color.—Principles of rhythm, balance, harmony; proportion; composition; still-life. *II*; (3). (Not given, 1917-18.)

Prerequisite: Household Science 22.]

[24. Color Application (Freehand).—Specific problems in modern interiors considering principles of form, color, balance, emphasis, and unity. *I*; (2). (Not given, 1917-18.)

Prerequisite: Household Science 23.]

[25. Color Application (Freehand).—(Continuation of 24). *II*; (2). (Not given, 1917-18.)

Prerequisite: Household Science 24.]

[26. Floor and Wall Coverings; Pictures.—The selection, framing, and hanging of pictures; floor and wall coverings, hangings and furniture as related to decorative unity of whole; relation of design to texture; scale. *I*; (3). (Not given, 1917-18.)

Prerequisite: Architecture 16, 34.]

[27. Furniture and Brasses.—History of furniture; relation of furniture to architecture; studies in period styles. *II*; (3). (Not given, 1917-18.)

Prerequisite: Household Science 3, 23; Architecture 16.]

28. Organization of the Household.—Factors determining form and functions of the household; division of labor; use of machinery; domestic service; retail markets; scientific management; cooperative housekeeping. *II*; (3).

Prerequisite: Household Science 15.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Household Science	28	3	—	11	—	11	—	11	—	121 W. B.	Perry

Courses for Graduates

This department offers graduate work along two lines, one dealing with the applications of the biological and physical sciences to the problems of food and nutrition; the other with the economic problems of the household. In either case the student must offer a minimum of ten hours' work with food, eight with textiles and clothing, five with the house, eight of chemistry, eight of biological science, and three in the principles of economics. In addition each student must offer five additional hours in economics or a second year of chemistry including quantitative and organic chemistry, according to the line of specialization.

101. Home Economics.—Origin and development of home economics; its industrial, educational, and sociological aspects. *Twice a week; I; (1 unit).* *Time to be arranged.* Professor BEVIER

102. Special Investigations.—Problems in the application of the principles of bacteriology, chemistry, and physiology to the ordinary processes used in the preparation of food; problems in nutrition. *Twice a week; I, II; (1 unit).* *Time to be arranged.* Professor BEVIER and Assistant Professor WHEELER

103. Seminar.—Recent advances in nutrition. *Once a week; II; (½ unit).* *Time to be arranged.* Assistant Professor WHEELER

104. Economic Problems of the Family Group.—An intensive study of the economic phases of selected problems of the household. *Twice a week; I, II; (1 unit).* *Time to be arranged.* Dr. PERRY

ITALIAN

(See ROMANCE LANGUAGES AND LITERATURE)

JOURNALISM

(See RHETORIC, under THE ENGLISH LANGUAGE AND LITERATURE)

LANDSCAPE GARDENING

(See HORTICULTURE)

LATIN

(See CLASSICS)

LAW

HENRY WINTHROP BALLANTINE, A.B., LL.B., *Professor and Dean*

OLIVER ALBERT HARKER, A.M., LL.D., *Professor*

FREDERICK GREEN, A.M., LL.B., *Professor*

Law

EDWARD HARRIS DECKER, A.B., LL.B., *Professor*

JOHN NORTON POMEROY, A.M., LL.B., *Professor*

WILLIAM GREEN HALE, B.S., LL.B., *Professor*

CHARLES ERNEST CARPENTER, A.M., LL.B., *Assistant Professor*

(For details as to courses, see special College of Law program to be issued September, 1917.)

First Year Courses

1a-1b. Contracts.—Keaner: *Cases on Contracts*, and Ballantine: *Problems in Law of Contracts*. I; (4); II; (3).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	1a	4	—	(See special Law program)						202 Law	Decker

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	1b	3	—	(See special Law program)							

2a-2b. Torts.—Ames and Smith: *Cases on Torts*. I; (3); II; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	2a	3	—	(See special Law program)						202 Law	Hale

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	2b	2	—	(See special Law program)						202 Law	Hale

3. Real Property.—Warren: *Cases on Property*. II; (3).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	3	3	—	(See special Law program)						—	Carpenter

5. Criminal Law.—Mikell: *Cases on Criminal Law and Procedure*. I; (3).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	5	3	—	3	—	3	—	3	—	202 Law	Ballantine

6. Personal Property.—Warren: *Cases on Property*. I; (3).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	6	3	—	8	8	8	—	—	—	—	Carpenter

7. Domestic Relations.—Kales: *Cases on Persons*, (2d edition). II; (2).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	7	2	—	(See special Law program)						—	Green

11. Agency.—Wambaugh: *Cases on Agency*. II; (3).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	11	3	—	—	—	11	11	11	—	202 Law	Carpenter

37a-37b. Introduction to the Study of Law and Brief Making.—I, II; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	37a	2	—	(See special Law program)						—	Decker

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Law	37b	2	—	(See special Law program)						—	Decker

Second and Third Year Courses

4. Common Law Pleading.—Sunderland: *Cases on Common Law Pleading*. I; (3).
Professor BALLANTINE

8. **Evidence.**—Thayer: *Cases on Evidence* (2d edition). I; (4).
Professor HALE
9. **Sales.**—Williston: *Cases on Sales* (2d edition). I; (3). Professor HALE
10. **Real Property.**—Aigler: *Cases on Property* (2d edition). II; (4).
Professor BALLANTINE
- 12a-12b. **Equity.**—Ames: *Cases on Equity*. I; (3); II; (2).
Professor POMEROY
- [13. **Damages.**—Beale: *Cases on Damages* (2d edition). I; (2). (Not given, 1917-18.)]
14. **Carriers.**—Green: *Cases on Carriers*. II; (2). Professor GREEN
15. **Bills and Notes.**—Huffcut: *Cases on Bills and Notes* (Colson's edition).
I; (2). Professor DECKER
16. **Trusts.**—Ames: *Cases on Trusts* (2d edition). II; (3).
18. **Wills.**—Warren: *Cases on Wills*. II; (2). Professor POMEROY
19. **Partnership.**—Gilmore: *Cases on Partnership* (2d edition). I; (2).
Assistant Professor CARPENTER
20. **Equity Pleading.**—*Selected Illinois and Federal Cases on Equity Pleading*.
II; (2). Professor HARKER
- [24. **Municipal Corporations.**—Beale: *Cases on Municipal Corporations*. II;
(2). (Not given, 1917-18.)]
27. **Future Interests in Property.**—I; (3). Assistant Professor CARPENTER
28. **Insurance.**—I; (2). Given in 1917-18 and alternate years.
Professor GREEN
30. **Public International Law.**—Lawrence: *Principles of International Law*.
Scott: *Cases on International Law*. I; (2). Professor GARNER
32. **Quasi-Contracts.**—Thurston: *Cases on Quasi-Contracts*. I; (2).
Assistant Professor CARPENTER
33. **Restraint of Trade.**—Kales: *Cases on Combinations*. II; (2).
Professor HALE
- [34. **Public Utilities.**—Burdick: *Cases on Public Service Companies* (2d
edition). II; (2). (Not given, 1917-18.)]
- 35b. **Moot Court.**—II; (1). Professor HARKER

Third Year Courses

- 4a. **Illinois Procedure.**—I; (3). Professor HARKER
17. **Private Corporations.**—Canfield and Wormser: *Cases on Private Corpora-
tions*. II; (4). Professor GREEN
21. **Suretyship.**—Ames: *Cases on Suretyship*. II; (3). Professor DECKER
22. **Constitutional Law.**—Hall: *Cases on Constitutional Law*. I; (4).
Professor GREEN
23. **Mortgages.**—Wyman: *Cases on Mortgages*. II; (2).
Professor POMEROY
25. **Bankruptcy.**—Williston: *Cases on Bankruptcy* (2d edition). I; (2).
Professor POMEROY

Library Science

26. **Legal Ethics.**—Costigan: *Cases in Legal Ethics*. I; (1).
Professor HARKER
29. **Office Practise.**—Selected abstracts and problems. II; (2).
Assistant Professor CARPENTER
31. **Conflict of Laws.**—Beale: *Shorter Selection of Cases on Conflict of Laws*.
I; (3). Assistant Professor CARPENTER
- 36a-36b. **Moot Court.**—I, II; (2). Professor HARKER
39. **Statutes.**—Freund: *Standards of American Legislation*. II; (2).
Professor BALLANTINE

LIBRARY SCIENCE

PHINEAS LAWRENCE WINDSOR, Ph.B., *Director*
FRANCES SIMPSON, M.L., B.L.S., *Assistant Director, Assistant Professor*
FLORENCE RISING CURTIS, A.M., B.L.S., *Associate*
ETHEL BOND, A.B., B.L.S., *Instructor*
EMMA FELSENTHAL, Ph.B., B.L.S., *Instructor*
EDNA LYMAN SCOTT, *Special Lecturer*
FRANCIS KEESE WYNKOOP DRURY, A.M., B.L.S., *Lecturer, Order*
ALICE SARAH JOHNSON, A.B., B.L.S., *Lecturer, General Reference*
MARGARET HUTCHINS, A.B., B.L.S., *Lecturer, General Reference*
MARGARET STUART WILLIAMS, A.B., B.L.S., *Lecturer, General Reference*

Courses for Freshmen and Sophomores

12. **General Reference.**—Classification and arrangement of books in the University library; the card catalogs; the more generally used reference books. (Intended for freshmen and sophomores in the University, not for students in Library School.) Repeated each semester. I or II; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 12	2		A	3	—	—	—	—	—	305 Lib.	—
			B	—	9	—	—	—	—	305 Lib.	Hutchins
			C	—	3	—	—	—	—	305 Lib.	Johnson
			D	—	—	2	—	—	—	305 Lib.	—
			E	—	—	—	—	11	—	305 Lib.	Williams
			F	—	—	—	—	2	—	305 Lib.	Felsenthal
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			A	3	—	—	—	—	—	305 Lib.	—
			B	—	10	—	—	—	—	305 Lib.	Hutchins
			C	—	3	—	—	—	—	305 Lib.	Johnson
			D	—	—	2	—	—	—	305 Lib.	—
			E	—	—	—	—	11	—	305 Lib.	Williams
			F	—	—	—	—	2	—	305 Lib.	Felsenthal

Courses for Juniors in the Library School

2a-2b. **Reference.**—Methods of bibliographical research; the use of reference books; practical work in the reference department of the University library. I, II; (3).

				FIRST SEMESTER									
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor		
Library Science 2a	3		A	9	—	9	—	9	—	305 Lib.	Simpson		
			B	11	—	11	—	11	—	305 Lib.	Simpson		
				SECOND SEMESTER									
Library Science 2b	3		—	Sections and schedule the same as for 2a (first semester).									

3a-3b. Selection of Books.—Principles of selection for libraries of different types; standard lists, critical periodicals, and other aids; practise in writing book annotations. *I, II; (2).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 3a	2	—	—	—	8	—	8	—	—	305 Lib.	Felsenthal

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 3b	2	—	—	Schedule the same as for 3a (first semester).							

16. Order, Accession, and Shelf.—Order department records and routine; book-buying; publishers and discounts; serials and continuations; gifts; exchanges; duplicates; the accession book and its substitutes; the shelf list and its uses; the care of pamphlets, clippings, and maps. *I; (2).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 16	2	—	—	—	10	—	10	—	—	305 Lib.	Curtis

17. Classification.—Principles of book classification; the Dewey Decimal Classification; the Cutter Expansion Classification; book numbers. *I; (3).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 17	3	—	—	10	—	10	—	10	—	305 Lib.	Bond

18. Cataloging.—Dictionary cataloging; subject headings; classed cataloging. *I; (3).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 18	3	—	—	8	—	8	—	8	—	305 Lib.	Bond

19. Trade Bibliography.—Books and periodicals used as tools of the book trade of America, England, Germany, and France. *II; (1).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 19	1	—	—	—	9	—	—	—	—	305 Lib.	—

20. Loan Department.—Records connected with the loan of books; representative loan systems; rules, regulations, and practises. *I; (1).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 20	1	—	—	—	—	—	9	—	—	305 Lib.	Bond

21. Printing, Binding, and Indexing.—*Printing:* printing for libraries; preparing copy and reading proof. *Binding:* materials and methods of bookbinding for libraries; practise in preparing books for the bindery and in making necessary records. *Indexing:* indexes; the form of citation; the choice and arrangements of headings; kind of type. *II; (2).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 21	2	—	—	—	—	8	—	8	—	305 Lib.	Windsor Curtis

22. Library Extension.—Methods; library associations; library schools; library commissions; township and county library systems; traveling libraries; home libraries; other agencies. *II; (3).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 22	3	—	—	10	—	10	—	10	—	305 Lib.	Curtis

Library Science

23a-23b. Library Administration and Current Library Literature.—Current library periodicals, bulletins, reports, catalogs, and reading lists; copyright; the organization, reorganization, and administration of small libraries; the planning and equipment of reading rooms and small library buildings; library accounts and business forms. This course includes an inspection trip to libraries and book-publishing firms in selected cities, requiring about one week and costing approximately twenty dollars (\$20.00). *I, II; (1).*

Subject	No. Credits	Section	FIRST SEMESTER							Room	Instructor
			M	T	W	T	F	S			
Library Science 23a	1	—	—	11	—	—	—	—	305 Lib.	Curtis	

SECOND SEMESTER											
Library Science 23b	1	—	Schedule the same as for 23a (first semester).								

30. Practise.—Work in the various departments of the University library. To be taken with Library 2, 16, 17, 18, 19, 20, and 21. *II; (3).*

Subject	No.	Credits	Section	SECOND SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Library Science 30	3			(Arrange)								

Courses for Juniors and Seniors in the Library School

[7. History of Libraries.—The foundation, development, and resources of the leading libraries of Europe and the United States. *II; (2).* Given in alternate years. (Not given, 1917-18).]

9. History of Books and Printing.—History of the early forms of books; the invention and spread of printing; book illustration; book-binding. *II; (2).* Given in alternate years.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science	9	2	—	—	2	—	2	—	—	305 Lib.	Windsor

Courses for Seniors in the Library School

8. Advanced Reference.—Transactions of learned societies; special periodicals and government publications; indexes and other works of value to a large reference department. *I; (2).*

Prerequisite: Library 2a-2b.

			FIRST SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Library Science	8	2	—	—	9	—	9	—	—	309 Lib.	Simpson

13a-13b. Public Documents.—First semester: production and distribution of United States documents; their treatment and use as reference books. Second semester: American state and municipal documents; publications of foreign governments. *I, II; (2).*

			FIRST SEMESTER								
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor	
Library Science 13a	2	—	—	—	9	—	9	—	309 Lib.	—	

SECOND SEMESTER											
Library Science 13b	2	—	Schedule the same as for 13a (first semester).								

15a-15b. Seminar in Library Economy.—Special problems; library economy publications. *I, II; (2).*

Subject	No. Credits	Section	FIRST SEMESTER							Room	Instructor
			M	T	W	T	F	S			
Library Science 15a	2	—	8-10	—	—	—	—	—	309 Lib.	Simpson and others	

SECOND SEMESTER											
Library Science 15b	2	—	Schedule the same as for 15a (first semester).								

24a-24b. Selection of Books.—English translations of representative works of French, German, Spanish, Italian, and Russian novelists of the 19th century; examination of about forty newly published books. *I, II; (2).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 24a	2		—	—	10	—	10	—	—	309 Lib.	Felsenthal

SECOND SEMESTER											
Library Science 24b	2		—	Schedule the same as for 24a (first semester).							Drury Scott

26a-26b. Library Administration.—Advanced order work; library organization; library architecture; legislative and municipal reference work; library work with children; special topics. This course includes an inspection trip to libraries and book-publishing firms in selected cities, requiring about one week and costing approximately twenty dollars (\$20.00); and also one month of field work in a designated library, costing approximately forty dollars (\$40.00). *I, II; (3).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 26a	3		—	10	—	10	—	10	—	—	} Simpson Drury Scott

SECOND SEMESTER											
Library Science 26b	3		—	Schedule the same as for 26a (first semester).							

27. Bibliographical Institutions.—Organization and work of bibliographical societies and institutions of America and Europe; cooperative bibliographical undertakings; international bibliography. *I; (1).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 27	1		—	—	—	—	8	—	—	309 Lib.	—

28. Practise.—Advanced practise in certain departments of the University library. *II; (1 to 4).¹ Time to be arranged.*

29. Advanced Classification and Cataloging.—Systems of book classification; rules for cataloging books. *II; (2).*

Prerequisite: Library 17, 18.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 29	2		—	—	—	11	—	11	—	309 Lib.	Bond

40a-40b. Practise.—A continuation of Library 30 supplemented by one month of work as a member of the staff of an assigned public library. *I II; (3).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 40a	3		—	(Arrange)							Curtis

SECOND SEMESTER											
Library Science 40b	4		—	(Arrange)							—

41a-41b. Subject Bibliography.—Selection of books in special subjects; the literature and bibliography of each. Lectures by professors in the respective departments of the University. *I, II; (1).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Library Science 41a	1		—	—	11	—	11	—	—	309 Lib.	Windsor and others

SECOND SEMESTER											
Library Science 41b	1		—	Schedule the same as for 41a (first semester).							

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., *not* 1-4, but 1, or 2, or 3, or 4.

MATHEMATICS

EDGAR JEROME TOWNSEND, Ph.D., LL.D., *Professor*
 GEORGE ABRAM MILLER, Ph.D., *Professor*
 HENRY LEWIS RIETZ, Ph.D., *Professor*
 JAMES BYRNIE SHAW, D.Sc., *Associate Professor*
 CHARLES HIRSCHSEL SISAM, Ph.D., *Assistant Professor*
 ARNOLD EMCH, Ph.D., *Assistant Professor*
 ROBERT D CARMICHAEL, Ph.D., *Assistant Professor*
 ARTHUR ROBERT CRATHORNE, Ph.D., *Assistant Professor*
 ERNEST BARNES LYTLE, Ph.D., *Associate*
 GUSTAF ERIC WAHLIN, Ph.D., *Associate*
 AUBREY JOHN KEMPNER, Ph.D., *Associate*
 EDWARD WILSON CHITTENDEN, Ph.D., *Instructor*
 LYMAN M KELLS, Ph.D., *Instructor*
 JOHN ROGERS MUSSELMAN, Ph.D., *Instructor*
 RAYMOND FRANKLIN BORDEN, A.M., *Assistant*
 CLARENCE HUDSON RICHARDSON, B.S., *Assistant*
 HOBERT DICKINSON FRARY, M.E., M.S. *Assistant*
 WILLIAM EDMUND EDINGTON, A.B., *Assistant*
 HARRY MILLER BASSLER, A.B., *Assistant*
 ROSCOE WOODS, M.S., *Assistant*
 ARTHUR WILLIAM LARSEN, A.M., *Assistant*
Cooperating:
 JOEL STEBBINS, Ph.D., *Professor of Astronomy*

Major: 20 hours made up from any undergraduate courses offered by the department, except Mathematics 2, 4, and 8, and including Mathematics 7 and 9.

Minors: 20 hours selected from physics, chemistry, and astronomy.

2. College Algebra.—I or II; (3).

Prerequisite: Entrance algebra, $1\frac{1}{2}$ units; plane geometry, 1 unit.

				FIRST SEMESTER							
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	2	3	A1 ¹	8	—	8	—	8	—	419 N. H.	Bassler
			A2 ¹	8	—	8	—	8	—	422 N. H.	Musselman
			A3 ¹	8	—	8	—	8	—	308 U. H.	Edington
			B1 ¹	9	—	9	—	9	—	423 N. H.	Borden
			B2 ¹	9	—	9	—	9	—	418 N. H.	Chittenden
			B3 ¹	9	—	9	—	9	—	422 N. H.	Musselman
			D1 ¹	11	—	11	—	11	—	422 N. H.	Frery
			D2 ¹	11	—	11	—	11	—	434 N. H.	Crathorne
			D3 ¹	11	—	11	—	11	—	432 N. H.	Kempner
			D4 ¹	11	—	11	—	11	—	423 N. H.	Chittenden
			E1 ¹	1	—	1	—	1	—	425 N. H.	Denton
			E2 ¹	1	—	1	—	1	—	434 N. H.	Woods
			F1 ¹	2	—	2	—	2	—	423 N. H.	Wahlin
			F2 ¹	2	—	2	—	2	—	425 N. H.	Denton
			R1	8	—	8	—	8	—	423 N. H.	Borden
			S1	9	—	9	—	9	—	434 N. H.	Edington
			S2	9	—	9	—	9	—	419 N. H.	Richardson
			T1	10	—	10	—	10	—	425 N. H.	Lytle
			T2	10	—	10	—	10	—	423 N. H.	Carmichael
			T3	10	—	10	—	10	—	419 N. H.	Shaw
			W1	2	—	2	—	2	—	418 N. H.	Kells
			X1	3	—	3	—	3	—	423 N. H.	Kells

¹For engineers.

SECOND SEMESTER¹

B1	9	—	9	—	9	—	418 N. H.	Woods
B2	9	—	9	—	9	—	425 N. H.	Lytle
D1	11	—	11	—	11	—	423 N. H.	Chittenden
D2	11	—	11	—	11	—	418 N. H.	Richardson
G1	3	—	3	—	3	—	418 N. H.	Kells

3. Algebra.—(For students presenting only one unit of entrance algebra.) In addition to the work of college algebra (Math. 2), there is covered the more advanced topics of elementary algebra. *I*; (5).

Prerequisite: Entrance algebra, one unit; plane geometry, one unit.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	3	5	—	9	9	9	9	9	9	425 N. H.	Lytle

4. Plane Trigonometry.—*I* or *II*; (2).

Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	4	2	A1 ²	—	8	—	8	—	—	419 N. H.	Bassler
			A2 ²	—	8	—	8	—	—	422 N. H.	Musselman
			A3 ²	—	8	—	8	—	—	308 U. H.	Edington
			B1 ²	—	9	—	9	—	—	431 N. H.	Emch
			B2 ²	—	9	—	9	—	—	418 N. H.	Chittenden
			B3 ²	—	9	—	9	—	—	422 N. H.	Musselman
			D1 ²	—	11	—	11	—	—	422 N. H.	Sisam
			D2 ²	—	11	—	11	—	—	434 N. H.	Richardson
			D3 ²	—	11	—	11	—	—	432 N. H.	Kempner
			D4 ²	—	11	—	11	—	—	423 N. H.	Chittenden
			E1 ²	—	1	—	1	—	—	425 N. H.	Denton
			E2 ²	—	1	—	1	—	—	434 N. H.	Woods
			F1 ²	—	2	—	2	—	—	423 N. H.	Wahlin
			F2 ²	—	2	—	2	—	—	425 N. H.	Denton
			R1	—	8	—	8	—	—	423 N. H.	Borden
			S1	—	9	—	9	—	—	434 N. H.	Edington
			S2	—	9	—	9	—	—	419 N. H.	Richardson
			T1	—	10	—	10	—	—	425 N. H.	Lytle
			T2	—	10	—	10	—	—	423 N. H.	Carmichael
			T3	—	10	—	10	—	—	419 N. H.	Edington
			W1	—	2	—	2	—	—	418 N. H.	Kells
			X1	—	3	—	3	—	—	423 N. H.	Wahlin

SECOND SEMESTER¹

B ₁	—	9	—	9	—	—	431 N. H.	Emch
B ₂	—	9	—	9	—	—	423 N. H.	Borden
D ₁	—	11	—	11	—	—	423 N. H.	Chittenden
D ₂	—	11	—	11	—	—	418 N. H.	Miller
D ₃	—	11	—	11	—	—	434 N. H.	Carmichael
G ₁	—	3	—	3	—	—	418 N. H.	Kells
G ₂	—	3	—	3	—	—	422 N. H.	Frary
G ₃	—	3	—	3	—	—	434 N. H.	Woods

6. Analytic Geometry.—Plane and solid analytic geometry. *II*; (5).

Prerequisite: Mathematics 2, 4.

¹Provided primarily for those who fail the first semester.

²For engineers.

Mathematics

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	6	5	A1 ¹	8	8	8	8	8	—	418 N. H.	Chittenden
			A2 ¹	8	8	8	8	8	—	422 N. H.	Woods
			A3 ¹	8	8	8	8	8	—	419 N. H.	Bassler
			B1 ¹	9	9	9	9	9	—	422 N. H.	Sisam
			B2 ¹	9	9	9	9	9	—	419 N. H.	Shaw
			D1 ¹	11	11	11	11	11	—	432 N. H.	Kempner
			D2 ¹	11	11	11	11	11	—	425 N. H.	Denton
			E1 ¹	1	1	1	1	1	—	434 N. H.	Edington
			E2 ¹	1	1	1	1	1	—	418 N. H.	Musselman
			F1 ¹	2	2	2	2	2	—	423 N. H.	Wahlin
			F2 ¹	2	2	2	2	2	—	418 N. H.	Kells
			R1	8	8	8	8	8	—	423 N. H.	Borden
			S1	9	9	9	9	9	—	434 N. H.	Crathorne
			S2	9	9	9	9	9	—	432 N. H.	Richardson
			T1	10	10	10	10	10	—	425 N. H.	Lytle
			T2	10	10	10	10	10	—	418 N. H.	Miller
			W1	2	2	2	2	2	—	419 N. H.	Bassler
			X1	3	3	3	3	3	—	423 N. H.	Wahlin

7-9. Differential and Integral Calculus.—The principles developed and applied to functions of one and of several variables. (Section A1 is an honor section and may be selected by those specializing in mathematics or having an average grade of 90 in freshman mathematics.) *I*; (5); *II*; (3).

NOTE.—Two sections of Mathematics 7 are given the second semester.

Prerequisite: Mathematics 6.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	7	5	A1 ²	8	8	8	8	8	—	425 N. H.	Rietz
			A2	8	8	8	8	8	—	434 N. H.	Crathorne
			A3	8	8	8	8	8	—	418 N. H.	Chittenden
			A4	8	8	8	8	8	—	432 N. H.	Kempner
			A5	8	8	8	8	8	—	—	Frary
			C1	10	10	10	10	10	—	431 N. H.	Emch
			C2	10	10	10	10	10	—	422 N. H.	Sisam
			C3	10	10	10	10	10	—	434 N. H.	Townsend
			E1	1	1	1	1	1	—	423 N. H.	Wahlin
			E2	1	1	1	1	1	—	418 N. H.	Kells
SECOND SEMESTER ²											
			E1	1	1	1	1	1	—	425 N. H.	Denton
			E2	1	1	1	1	1	—	422 N. H.	Frary
SECOND SEMESTER											
Mathematics	9	3	A1 ²	8	—	8	—	8	—	425 N. H.	Rietz
			A2	8	—	8	—	8	—	434 N. H.	Crathorne
			A3	8	—	8	—	8	—	432 N. H.	Kempner
			A4	—	8	—	8	—	8	425 N. H.	Musselman
			C1	10	—	10	—	10	—	423 N. H.	Carmichael
			C2	10	—	10	—	10	—	431 N. H.	Denton
			C3	10	—	10	—	10	—	434 N. H.	Chittenden
			C4	10	—	10	—	10	—	— N. H.	Emch
			E1	1	—	1	—	1	—	423 N. H.	Wahlin
			E2	1	—	1	—	1	—	419 N. H.	Kells

8. Differential and Integral Calculus.—(For students in chemistry and chemical engineering.) *I*; (5).

Prerequisite: Mathematics 6.

¹For engineers.

²Honor section. See conditions given in description of course above.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	8	5	C1	10	10	10	10	10	—	418 N. H.	Miller
			C2	10	10	10	10	10	—	— N. H.	Musselman

9a. Differential and Integral Calculus.—(Second Course.) The definite (single and multiple) integral; the formation of problems in applied mathematics; line surface, and volume integrals; the theorem of Stokes and Green; partial differentiation; exact integrals with applications of the conditions for exactness; elements of differential equations, approximate quadrature and integration of differential equations. *I*; (2).

Prerequisite: Mathematics 7 and 9, or 8.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	9a	2	B1	9	—	9	—	—	—	431 N. H.	Denton
			C1	—	10	—	10	—	—	432 N. H.	Crathorne
			C2	—	10	—	10	—	—	— T. B.	Denton
			D1	—	11	—	11	—	—	419 N. H.	Shaw
			D2	—	11	—	11	—	—	418 N. H.	Kells

Courses for Advanced Undergraduates and Graduates

10. Theory of Equations and Determinants.—Fundamental properties of an algebraic equation in one unknown; the solutions of systems of simultaneous equations; theory of a system of linear equations; some fundamental properties of determinants. *I*; (3).

Prerequisite: Mathematics 7 and 9, or 8.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	10	3	—	11	—	11	—	11	—	418 N. H.	Miller

16-17. Differential Equations and Advanced Calculus.—Ordinary and partial differential equations; special topics of calculus, of value in the application of mathematics. *I, II*; (3).

Prerequisite: Mathematics 7 and 9, or 8.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	16	3	—	2	—	2	—	2	—	434 N. H.	Townsend

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	17	3	—	Schedule the same as for 16 (first semester).							

18. Constructive Geometry.—Development and training of space perception; properties of lines, planes, and the simpler surfaces of the second order, studied by methods of parallel and central projection; graphical interpretation of the processes of analytic geometry; analytic discussion of the methods of descriptive geometry. *II*; (3).

Prerequisite: Mathematics 6.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	18	3	—	9	—	9	—	9	—	431 N. H.	Emch

19. Solid Analytic Geometry.—Equations of the plane and right line in space; properties of surfaces of the second degree; the classification and special properties of quadrics; the theory of surfaces. *II*; (3).

Prerequisite: Mathematics 10.

Mathematics

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	19	3	—	10	—	10	—	10	—	422 N. H.	Sisam

21. Method of Least Squares.—Law of probability and error; adjustment of observations; precision of observation; independent and conditional observations. *I*; (2).

Prerequisite: Mathematics 7 and 9, or 8.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	21	2	—	—	2	—	2	—	—	Obs.	Stebbins

22. The Theory and Use of Mathematical Instruments.—The mathematical theory underlying such instruments as the harmonic analyser, the integrator, and various forms of the planimeter, together with their practical use and a consideration of the degree of accuracy. Two lectures, one laboratory period a week. *II*; (3).

Prerequisite: Mathematics 7 and 9.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	22	3	—	11	—	11	—	11	—	434 N. H.	Crathorne

23. Averages and Mathematics of Investment.—Meaning, use, and abuse of different kinds of averages; their relation to the theory of probability; application of the elements of probability to annuities, insurance, and branches of science; loans and investments; problems in the evaluation of investment securities. *II*; (3).

Prerequisite: Mathematics 2; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	23	2	—	9	—	9	—	9	—	423 N. H.	Musselman

35. Teachers' Course.—Secondary algebra and geometry; their educational value; position in course; methods of teaching; correlation; comparison of American methods with those of foreign countries; order and importance of topics; text-books; literature. Lectures; discussions; reports. *I*; (2).

Prerequisite: Eighteen hours of mathematics.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	35	2	—	—	11	—	11	—	—	435 N. H.	Lytle

40. Fundamental Concepts of Mathematics.—The concepts of higher mathematics in their bearing on elementary mathematics. *II*; (2).

Prerequisite: Eighteen hours of mathematics.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Mathematics	40	2	—	—	11	—	11	—	—	435 N. H.	Lytle

Courses for Graduates

100. Seminar and Thesis.—*Three times a week; I, II; (1 or 2 units).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Mathematics	100	1 or 2 units	—	(Arrange)						—	Professors in department

102. Functions of a Complex Variable.—General introduction to the theory of functions of a complex variable with applications. *I, II; (1 unit).*

Prerequisite: Mathematics, 7, 9, 16-17.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	102	1 unit	—	3	—	3	—	3	—	435 N. H.	Townsend

112. Theory of Linear Difference Equations.—General introduction; the gamma functions; general existence theorems; expansions in functions defined by difference equations and applications to the theory of functions; transcendental functions. *I, II; (1 unit).*

Prerequisite: Mathematics 102.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	112	1 unit	—	11	—	11	—	11	—	435 N. H.	Carmichael

120. Elementary Theory of Groups.—Groups in arithmetic, geometry, and trigonometry; groups which can be represented with a small number of letters; the abstract group theory; the Galois theory of equations. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 33-34.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	120	1 unit	—	9	—	9	—	9	—	435 N. H.	Miller

122. Modern Algebra.—Theory of matrices; system of linear equations; bilinear and quadratic forms; properties of polynomials; algebraic invariants; elementary divisors. *Three times a week; I, II; (1 unit).*

Prerequisite: Mathematics 7, 9, 10.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	122	1 unit	—	10	—	10	—	10	—	435 N. H.	Kempner

129. Theory of Statistics.—Statistical investigation; application of the theory of probability to statistical data; fitting curves to observation; interpolation; theory of errors; variability and correlation; problems in economics, sociology, and biology. *I, II; (1 unit).*

Prerequisite: Mathematics 8, (or 7, 9).

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	129	1 unit	—	9	—	9	—	9	—	207 Com.	Rietz

131. Algebraic Surfaces.—Homogeneous coordinates, invariants, and geometry of three dimensions; surfaces; special properties of surfaces of the third and fourth order. *I, II; (1 unit).*

Prerequisite: Mathematics 19.

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	131	1 unit	—	8	—	8	—	8	—	435 N. H.	Sisam

132. Projective Geometry.—Fundamental concepts; anharmonic ratio; projective pencils and ranges; transformations and groups; theory of conics and quadric surfaces; pencils and ranges of conics; quadratic transformations and projective theory of cubics; applications in mechanics. *I, II; (1 unit).*

BOTH SEMESTERS

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Mathematics	132	1 unit	—	8	—	8	—	8	—	431 N. H.	Emch

Mechanical Engineering

142. General Algebra.—Theory of linear associative algebra and hyphen numbers, with particular study of the systems useful for geometry and physics of n dimensions. Applications to relativity theories, and to general differential and integral invariants. Theory of linear operators and functional equations; applications to general analysis; integro-differential equations, infinite systems. General theory of operators; applications to general invariant theories. *I, II; (1 unit).*

Prerequisite: Mathematics 122, 141.

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Mathematics	142	1 unit	—	2	—	2	—	2	—	435 N. H.	Shaw

MECHANICAL ENGINEERING

CHARLES RUSS RICHARDS, M.M.E., *Professor*

GEORGE ALFRED GOODENOUGH, M.E., *Professor, Thermodynamics*

OSCAR ADOLPH LEUTWILER, M.E., *Professor, Machine Design*

ARTHUR CUTTS WILLARD, B.S., *Professor, Heating and Ventilation*

ARTHUR C HARPER, B.S., *Associate, Machine Design*

GUSTAVE ADOLPH GROSS, *Associate, Pattern Making*

GUSTAVE HOWARD RADEBAUGH, *Associate, Machine Practise*

ALONZO PLUMSTED KRATZ, M.S., *Research Associate, Engineering Experiment Station*

CLAUDE LOWELL HARRELL, B.S., M.S., *Instructor, Mechanical Engineering*

HARRY FREDERICK GODEKE, B.S., *Instructor*

CLEON EDGAR PHELPS, B.S., *Assistant to the Director of Shop Laboratories*

WILLIAM H SEVERNS, B.S., *Instructor, Mechanical Engineering*

WILL D MOYER, B.S., M.E., *Instructor in Mechanical Engineering*

EDGAR THOMAS LANHAM, *Instructor, Forge Practise*

ROBERT EDWIN KENNEDY, *Instructor, Foundry Practise*

JAMES HARVEY HOGUE, *Instructor, Foundry Practise*

JEREMIAH AMOS DE TURK, *Instructor, Machine Practise*

LEROY ALONZO WILSON, M.M.E., *First Assistant, Engineering Experiment Station*

JAMES MERION DUNCAN, *Assistant, Pattern Making*

PETER JOSEPH REBMAN, *Assistant, Forge Practise*

JOHN ALEXANDER FRISK, *Assistant and Mechanician*

1. Steam and Air Machinery.—The construction, operation, and care of boilers, engines, and air compressors; elementary thermodynamics; steam engine performance; transmission of compressed air and its applications. (For students in civil and mining engineering.) *I; (3).*

Prerequisite: Junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	1	3	E F	2	—	2	—	2	—	308 E. H.	—
			G U	—	8	—	8	—	8	308 E. H.	—
			O	—	10	—	10	—	10	308 E. H.	—
			Z	8	—	8	—	8	—	102 E. H.	—

2. Steam Engineering.—Engines, boilers, pumps, condensers, and other steam machinery. *II; (3).*

Prerequisite: Physics 1a-1b, 3a-3b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	2	3	T	—	11	—	11	—	11	209 M. E. Lab.	—
			L V	10	—	10	—	10	305 E. H.	—	
			M N	—	10	—	10	—	10	305 E. H.	—

3. Steam Engineering.—The theory of the steam engine, steam turbine, and other steam machinery. (For students in mechanical engineering.) *I*; (3).

Prerequisite: Junior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	3	3	P	9	—	9	—	9	—	305 E. H.	—
			Q	8	—	8	—	8	—	305 E. H.	—

11. Thermodynamics and Heat Engines.—(For students in electrical engineering.) *I*; (3).

Prerequisite: Mechanical Engineering 1 or 2.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	11	3	N	9	—	9	—	9	—	308 E. H.	—
			L M V	8	—	8	—	8	—	308 E. H.	—

12. Thermodynamics.—The transformation of heat into work; the second law and its connection with irreversible processes; the properties of heat media; the perfect gases; saturated and superheated vapors; the flow of fluids. *II*; (5).

Prerequisite: Mathematics 9a; Theoretical and Applied Mechanics 21.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	12	5	P	9	9	9	9	9	—	308 E. H.	—
			Q W	11	11	11	11	11	—	308 E. H.	—

15. Gas Power Engineering.—Internal combustion engines; liquid and gaseous fuels and their combustion; gas producers. *I* (3).

Prerequisite: Mechanical Engineering 12.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	15	3	P Q	11	—	11	—	11	—	305 E. H.	—

23. Mechanical Equipment of Buildings.—Theory and practise of designing simple systems for the mechanical equipment of buildings, including heating and ventilation, refrigeration, fire protection, vacuum cleaning, elevators, lighting, and small power plants. Lectures; laboratory. *I*; (5).

Prerequisite: Senior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	23	5	C	11	—	11	—	11	8-12	M. L.	—
			D	11	—	11	—	8-11	11	M. L.	—

25. Heating and Ventilation for Architects.—The theory and the application of the principles of heating and ventilation to modern practise. Direct and indirect steam and hot water heating; furnace heating; ventilation and air analysis; air conditioning; temperature and humidity control. *I*; (2).

Prerequisite: Senior standing.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	25	2	A B	—	11	—	11	—	—	M. L.	—

Mechanical Engineering

26. Heating and Ventilation.—The theory and the application of the principles of heating and ventilation to modern practise. Steam boilers and water heaters of steel and cast iron for heating service; heat losses from buildings; direct and indirect steam and hot water heating, using gravity systems; furnace heating; fan blast or mechanical indirect systems; exhaust steam heating; district heating by steam and water; ventilation and air analysis; air conditioning; temperature and humidity control. *II*; (3).

Prerequisite: Mechanical Engineering 65.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	26	3	P	9	—	9	—	9	11	M. L.	—
			Q	2	—	2	—	2	11	M. L.	—

30. Mechanics of Machinery.—Mechanisms and mechanical movements; cams, gears, valve gears, and quick-return motions; graphical constructions for displacement, velocity and acceleration; kinetics of the steam engine mechanism and similar mechanisms; balancing; critical speeds; force and mass reduction. *II*; (5).

Prerequisite: Theoretical and Applied Mechanics 21.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	30	5	P	11	10-12	11	10-12	11	—	305 E. H.	—
			Q	9	8-10	9	8-10	9	—	305 E. H.	—

32. Power Transmission.—Shafting, belts, ropes, cables, water, air, gas, and steam as power transmitters; the measurement and storage of power. *II*; (3).

Prerequisite: Mechanical Engineering 12 and 43.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	32	3	P Q	11	—	11	—	11	—	M. L.	—

33. Principles of Aviation.—Types and uses of aeroplanes; lift and drag; wind shapes and arrangements; wind tunnels and determination of coefficients; resistance of aeroplane parts; performance curves of typical military aeroplanes. *I*; (3).

Prerequisite: Senior standing in M. E., E. E., or C. E.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	33	3	P Q	11	—	11	—	11	—	209 M. L.	—

34. Principles of Aeronautics.—Lectures and problems: Principles of aeroplane stability; aeroplane stresses; principles of propellers; aero engines; aeronautical meteorology; principles of the dirigible balloon. Laboratory exercises: assembly and balancing of U. S. Navy seaplane; Curtiss motor assembly and operation; construction of propeller; testing propeller on block; strength tests of aeroplane parts. *II*; (2).

Prerequisite: Mechanical Engineering 33.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	34	2	P Q	—	10	—	10	—	—	308 E. H.	—

37. Principles of Management.—Industrial development; modern industrial tendencies; principles of organization; selection and compensation of labor; application of science to industrial problems; practical shop systems of management; production. *I*; (3).

Prerequisite: Mechanical Engineering 81, 82.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	37	3	P Q W	11	—	11	—	11	—	W. S.	—

43. Engineering Design.—Theory of machine design, with application; investigation of actual machines similar to the one to be designed; design of machinery subjected to heavy and variable stresses; punches, shears, presses, riveters, and cranes. *I*; (5).

Prerequisite: Theoretical and Applied Mechanics 29; Mechanical Engineering 30.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
M. E.	43	5	P	1-4	11	1-4	11	1-4	—	305 E. H.	_____
										308 E. H.	_____
			Q	1-4	1	1-4	1	1-4	—	309 E. H.	_____
										312 E. H.	_____

44. Engineering Design.—Design and commercial application of special tools, fixtures, jigs, dies, and gauges used in modern high production manufacturing. *II*; (2).

Prerequisite: Mechanical Engineering 37 and 43.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
M. E.	44	2	P Q	—	8-11	—	8-11	—	—	309 E. H.	_____

52. Power Plant Design.—Study and design of some form of steam power plant. *II*; (3).

Prerequisite: Mechanical Engineering 43 and 65.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
M. E.	52	3	P	1-4	—	1-4	—	1-4	—	309 E. H.	_____
			Q	8-11	—	8-11	—	8-11	—	309 E. H.	_____

61. Power Measurement.—The testing and calibration of instruments and apparatus; use of the indicator; calculation of horse-power and steam consumption; reading of indicator diagrams; valve setting. (For students in electrical engineering.) *I*; (2).

Prerequisite: Mechanical Engineering 1 or 2.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
M. E.	61	2	M V	1-4	—	—	—	1-4	—	M. L.	_____
			N T	—	—	1-4	—	—	8-11	M. L.	_____

62. Power Measurement and Steam Engines.—Laboratory work, substantially the same as that given in Mechanical Engineering 61, supplemented by lectures on steam machinery. *II*; (3).

Prerequisite: Junior standing.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
M. E.	62	3	X W	—	8-11	—	8-11	—	8	M. L.	_____

64. Power Measurement.—Apparatus for engine and boiler tests—scales, thermometers, indicators, brakes and dynamometers, gauges, calorimeters; methods of calibrating and using such apparatus; tests for horse-power of steam engines; pumps, and gas engines. Reports. *II*; (3).

Prerequisite: Mechanical Engineering 2; registration in Mechanical Engineering 12 or Chemistry 31.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
M. E.	64	3	Q Z	1-5	—	—	—	1-5	—	M. L.	_____
			P	—	1-5	—	1-5	—	—	M. L.	_____

Mechanical Engineering

65. Power Laboratory.—Experiments on engines, turbines, gas engines, pumps, boilers, injectors, air compressors, hoisting appliances, heating apparatus, and the refrigerating machines. *I*; (3).

Prerequisite: Mechanical Engineering 12 and 64.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	65	3	P	—	1-5	—	1-5	—	—	M. L.	—
			Q	—	8-12	—	8-12	—	—	M. L.	—

66. Power Laboratory.—Special research work in the mechanical engineering laboratory. *II*; (2).

Prerequisite: Mechanical Engineering 65; senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	66	2	P Q	—	8-11	—	8-11	—	—	M. L.	—

71. Forge Work for Agricultural Students.—Forging and welding; tempering tools; pointing and hardening cultivator shovels, plow shares. *Six hours a week, either half of I or II*; (1). *Time to be arranged.*

73. Wood Work for Agricultural Students.—Carpentry for the farmer; use of tools; layout and construction of building joints; repairs to buildings and equipment. *Six hours a week, either half of I or II*; (1). *Time to be arranged.*

75. Forge Shop Practise and Management.—(9 weeks).—Modern forge shop practises, and management of metal forging plants. Planning, routing, dispatching, and inspection of work; time studies; production of standard parts; heat treatment of steel; case carbonizing; machine and hand forging; studies of forge shop practises; methods and equipment. *I* *or* *II*; (1).

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	75	1	L	—	8-11	—	8-11	—	8-10	M. S.	—
			M N	—	1-4	—	1-4	—	10-12	M. S.	—
			P Q	1-4	—	1-3	—	1-4	—	M. S.	—

77. Foundry Practise and Management.—(18 weeks).—Modern foundry practise and management. Planning, routing, dispatching, and inspection of work; time studies; production of standard castings; brass furnace and cupola practise; machine, bench and floor molding; core making; cleaning castings, tool and stock room methods; studies of foundry practises, methods and equipment. *I* *or* *II*; (3).

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	77	3	L	—	8-11	—	8-11	—	8-10	W. S.	—
			M N	—	1-4	—	1-4	—	10-12	W. S.	—
			P Q	1-4	—	1-3	—	1-4	—	W. S.	—

78.—Principles of Foundry Operation.—Principles underlying foundry operation. Foundry organization and management including planning, routing, dispatching, production, inspection, testing, cost accounting, etc.; foundry methods, processes, machines, tools, metals and materials in modern commercial foundries. (18 weeks). *I* *or* *II*.

Prerequisite: Two units of machine shop and foundry practise in accredited schools or colleges.

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. E.	78		L	—	8-11	—	8-11	—	8-10	W. S.	—
			M N	—	1-4	—	1-4	—	10-12	W. S.	—
			P Q	1-4	—	1-3	—	1-4	—	W. S.	—

79.—Pattern Shop Practise and Management.—(9 weeks.)—Training in modern pattern shop practises, and management of wood working plants. Planning, routing, dispatching, and inspection of work, time and cost keeping; time studies; work schedules; layout and construction of wood and metal patterns for both machine and hand molding; care and use of tools; machine operation; studies of pattern shop practises, methods and equipment. *I* or *II*; (2).

EITHER SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	79	2	L	—	8-11	—	8-11	—	8-10	W. S.	_____
			M N	—	1-4	—	1-4	—	10-12	W. S.	_____
			P Q	1-4	—	1-3	—	1-4	—	W. S.	_____

81.—Machine Shop Practise and Management.—(18 weeks.)—Modern machine shop practise and management of metal working plants. Manufacturing methods; shop management; planning, production; routing; dispatching; inspection; time studies; shop accounting; machine operation; assembling; testing; studies of machine shop practise, methods, and equipment. *I*; (3).

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	81	3	L V	8-11	—	8-10	—	8-11	—	M. S.	} _____
			MN	—	1-4	—	1-4	—	10-12	M. S.	
			P W	1-4	—	1-3	—	1-4	—	M. S.	
			Q	—	8-11	—	8-11	—	8-10	M. S.	

82. Machine Shop Practise and Management.—(Continuation of Mechanical Engineering 81). *II*; (2).

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	82	2	P	1-4	—	1-3	—	1-4	—	M. S.	_____
			Q W	—	1-4	—	1-4	—	10-12	M. S.	_____

83.—Principles of Factory Operation.—(18 weeks.)—Principles underlying factory operation. Practical training in organization and management of a machine shop manufacturing a line of standardized products by modern production methods. Planning; routing; dispatching; inspection; maintenance; testing; cost accounting, etc. Design methods, processes, machines, tools, and materials. *I* or *II*; (3).

Prerequisite: Two units of machine shop and foundry practice in accredited schools or colleges.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
M. E.	83	3	L V	8-11	—	8-10	—	8-11	—	M. S.	} _____ _____ _____
			M N	—	1-4	—	1-4	—	10-12	M. S.	
			P W	1-4	—	1-3	—	1-4	—	M. S.	
			Q	—	8-11	—	8-11	—	8-10	M. S.	
			SECOND SEMESTER								
			P	1-4	—	1-3	—	1-4	—	M. S.	} _____ _____
			Q W	—	1-4	—	1-4	—	10-12	M. S.	

98. Thesis.—Investigation of special subject and preparation of thesis embodying a review of the literature of the subject, the results of investigation, and a discussion of those results. *II*; (3). *Time to be arranged.*

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

Mechanics, Theoretical and Applied

Courses for Graduates

Entrance on graduate work in mechanical engineering presupposes the full undergraduate course in that subject.

106. Heat Motors.—The internal combustion motor; steam turbine. Principles and methods of refrigeration. *Twice a week; II; (1 unit). Time to be arranged.*
Professor GOODENOUGH

107. Thermodynamics.—Thermodynamics; their application to the solution of physical and engineering problems. *Twice a week; I; (1 unit). Time to be arranged.*
Professor GOODENOUGH

109. Machine Design.—Rational design; the application of mechanics of materials. Individual problems. *Twice a week; I or II; (1 unit). Time to be arranged.*
Professor LEUTWILER

112. Laboratory Investigation.—Combustion of fuel; boiler economy; steam engines and turbines; gas engines and producers; properties of explosive mixtures; mechanical refrigeration. Original work. *Three times a week; I, II; (1½ units). Time to be arranged.*
Professor RICHARDS and Associates

114. Dynamics of Machinery.—Advanced problems. Balancing; whirling and vibration of shafts; theory of governors; fly wheels; force and mass reduction; stresses in rotating masses. *Twice a week; I, II; (1 unit). Time to be arranged.*
Professor GOODENOUGH

MECHANICS, THEORETICAL AND APPLIED

ARTHUR NEWELL TALBOT, D.Sc., D.Eng., *Professor, Municipal and Sanitary Engineering; in charge of Theoretical and Applied Mechanics*

HERBERT FISHER MOORE, M.M.E., *Professor*

MELVIN LORENIUS ENGER, M.S., C.E., *Associate Professor*

VIRGIL R FLEMING, B.S., *Assistant Professor*

FRED B SEELY, M.S., *Assistant Professor*

GEORGE PAUL BOOMSLITER, M.S., *Associate*

NEWTON EDWARD ENSIGN, A.B., B.S., *Associate*

WILLIAM JAMES PUTNAM, B.S., *Instructor*

HAROLD MALCOLM WESTERGAARD, Ph.D., *Instructor*

FRANK ERWIN RICHART, M.S., *Instructor*

SOLOMON CADY HOLLISTER, B.S., *Instructor*

1. Analytical Mechanics.—Especially designed for graduates and advanced undergraduates in Arts and Sciences. *I; (3). Time to be arranged.* Mr. ENSIGN
Prerequisite: Mathematics 8 or 9.

2. Analytical Mechanics.—(A continuation of Theoretical and Applied Mechanics 1.) *Lamb: Dynamics. II; (3). Time to be arranged.* Mr. ENSIGN
Prerequisite: Theoretical and Applied Mechanics 1.

10. Hydraulics.—The pressure and flow of water; its utilization as motive power; observation and measurement of pressure; velocity, and flow; power and efficiency; determination of experimental coefficients. *Laboratory weekly. II; (3).*
Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 21.

Mechanics, Theoretical and Applied

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	10	3	E, Quiz	—	10	—	10	—	—	202 E. H.	Enger and others
			Laboratory	—	—	—	8, 9	—	—		
			F, Quiz	—	1	—	1	—	—	208 E. H.	
			Laboratory	—	10, 11	—	—	—	—		
			G, Quiz	—	2	—	2	—	—	208 E. H.	
			Laboratory	—	—	—	10, 11	—	—		

14. Elements of Mechanics.—Kinematics, kinetics, and statics. (For architects and others who have not taken the calculus.) *II*; (4).

Prerequisite: Mathematics 2, 4.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	14	4	A	—	9	9	9	9	—	203 T. B.	Boomsliter
			B	—	9	9	9	9	—	102 E. H.	

15-16. Strength of Materials.—Graphical methods of determining the elastic curve of beams; centroids and moments of inertia of areas; reinforced concrete beams and columns; properties and tests of engineering materials. (For students in architecture and others without the prerequisites required for Theoretical and Applied Mechanics 29.) Laboratory every other week. *I, II*; (3).

Prerequisite: Theoretical and Applied Mechanics 14.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	15	3	A	10	—	10	—	10,11	—	302 L. A. M.	Boomsliter
			B	—	1	—	1	—	10,11	302 L. A. M.	
SECOND SEMESTER											
T. & A. M.	16	3	A	10	—	10	—	10,11	—	302 L. A. M.	Boomsliter
			B	—	1	—	1	—	10,11	302 L. A. M.	

20. Analytical Mechanics.—The mechanics of engineering rather than that of astronomy and physics. Fundamental concepts; equilibrium, centroids and center of gravity, friction; engineering problems; statement of conditions and use of data. *II*; (3).

Prerequisite: Mathematics 7; registration in Mathematics 9.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	20	3	C	—	9	—	9	—	9	202 E. H.	Enger and others
			D	—	9	—	9	—	9	302 L. A. M.	
			E	—	1	—	1	—	10	103 T. B.	
			F	—	8	—	8	—	8	202 E. H.	
			G	—	8	—	8	—	8	302 L. A. M.	
			L	—	11	—	11	—	11	208 E. H.	
			M	8	—	8	—	8	—	202 L. A. M.	
			N	10	—	10	—	10	—	202 L. A. M.	
			P	—	10	—	10	—	10	202 L. A. M.	
			Q	8	—	8	—	8	—	302 L. A. M.	
			X	1	—	1	—	1	—	302 L. A. M.	
			Y	8	—	8	—	8	—	103 T. B.	
			Z	10	—	10	—	10	—	202 E. H.	

21. Analytical Mechanics.—Continuation of Theoretical and Applied Mechanics 20. Kinematics and kinetics. *I*; (2).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

Mechanics, Theoretical and Applied

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor
				M	T	W	T	F		
T. & A. M.	21	2	E	—	1	—	1	—	202 L. A. M.	Enger and others
			F	—	8	—	8	—	302 L. A. M.	
			G	—	10	—	10	—	208 E. H.	
			P	—	8	—	8	—	208 E. H.	
			Q	—	1	—	1	—	202 E. H.	
			X	—	8	—	8	—	202 E. H.	
			Z	—	10	—	10	—	202 E. H.	

25. Resistance of Materials.—A briefer course than Theoretical and Applied Mechanics 29. (For students in architectural, ceramic, chemical, electrical, and mining engineering.) *I*; (4).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
T. & A. M.	25	4	C,Quiz	1	—	1	—	1	—	202 E. H.	Enger and others
			Laboratory	—	—	—	—	2,3	—		
			D,Quiz	1	—	1	—	1	—	202 L. A. M.	
			Laboratory	—	—	—	—	8,9	—		
			L,Quiz	—	8	—	8	—	8	202 L. A. M.	
			Laboratory	—	—	10,11	—	—	—		
			M,Quiz	—	9	—	9	—	9	202 L. A. M.	
			Laboratory	1,2	—	—	—	—	—		
			N,Quiz	8	—	8	—	8	—	202 E. H.	
			Laboratory	10,11	—	—	—	—	—		
			X,Quiz	11	—	11	—	11	—	202 L. A. M.	
			Laboratory	—	10,11	—	—	—	—		
			Z,Quiz	10	—	10	—	10	—	202 E. H.	
			Laboratory	—	—	—	—	—	8,9		

26. Analytical Mechanics and Hydraulics.—Kinematics, kinetics, and hydraulics; problems; experiments in the hydraulic laboratory. (For students in architectural engineering, electrical engineering, and mining engineering.) Laboratory weekly during the last half of the semester. *II*; (4).

Prerequisite: Theoretical and Applied Mechanics 25.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
T. & A. M.	26	4	C,Quiz	1	—	1	—	1	—	202 E. H.	Enger and others
			Laboratory	—	—	—	—	2,3	—	202 E. H.	
			D,Quiz	1	—	1	—	1	—	202 L. A. M.	
			Laboratory	—	—	—	—	8,9	—	208 P. L.	
			L,Quiz	8	—	8	—	8	—	202 E. H.	
			Laboratory	—	—	—	—	8,9	—	219 E. H.	
			M,Quiz	—	9	—	9	—	9	202 L. A. M.	
			Laboratory	—	—	—	1,2	—	—	202 L. A. M.	
			N,Quiz	—	8	—	8	—	8	202 L. A. M.	
			Laboratory	—	1,2	—	—	—	—	202 L. A. M.	

29. Resistance of Materials.—The mechanics of materials; the properties and requirements for materials of construction; the effect of methods of manufacture on the quality of the material; specifications and standard tests; experiments and investigations in the materials laboratory. (For students in civil engineering, mechanical engineering, and municipal and sanitary engineering.) Recitations; lectures; assigned reading; laboratory weekly. *I*; (5).

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20; registration in Theoretical and Applied Mechanics 21.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	29	5	Lecture ¹	—	—	11	—	—	—		
			E,Quiz	1	—	1	—	1	—	302 L. A. M.	
			Laboratory	—	—	—	8,9	—	—		
			F,Quiz	8	—	8	—	8	—	202 L. A. M.	
			Laboratory	—	—	—	1,2	—	—		
			G,Quiz	10	—	10	—	10	—	208 E. H.	
			Laboratory	—	—	8,9	—	—	—		
			P,Quiz	8	—	8	—	8	—	302 L. A. M.	
			Laboratory	—	1,2	—	—	—	—		
			Q,Quiz	9	—	9	—	9	—	202 E. H.	
			Laboratory	—	—	1,2	—	—	—		

36. Analytical Mechanics.—The portion of Theoretical and Applied Mechanics 26, which involves analytical mechanics. (Open only to railway electrical engineering students.) *II; (2).*

Prerequisite: Theoretical and Applied Mechanics 25.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
T. & A. M.	36	2	L	8	—	8	—	8	—	202 E. H.	Enger
				—	—	—	—	—	8,9		

Courses for Graduates

Entrance on graduate work in theoretical and applied mechanics presupposes a full undergraduate course in that subject.

101. Analytical Mechanics.—Methods; problems and applications; critical and comparative study of texts. *Twice a week; I; (1 unit). Time to be arranged.*
Professor MOORE

102. Resistance of Materials.—Properties of materials used in engineering construction and the methods of determining these properties; analysis and investigation in mechanics of materials; the effect of form of member in a structure or machine; the method of application of forces; comparative study of texts. *Twice a week; II; (1 unit). Time to be arranged.*
Professor MOORE

103. Hydraulics and Hydraulic Engineering.—The laws of hydraulics and their application to engineering problems; hydraulic power and its development; design and investigation. *Twice a week; II; (1 unit). Time to be arranged.*
Professor TALBOT

104. Experimental Work in the Laboratory of Applied Mechanics.—Investigation on materials and on their action as used in machines and structures; experiments with pumps, motors, and measuring devices; investigation of the laws of hydraulics, the development of power, and the study of various hydraulic problems. *Twice a week; I, II; (½ to 2 units). Time to be arranged.*
Professor MOORE

105. Experimental and Analytical Work in Reinforced Concrete.—Research; interpretation of available experimental results and their application to the design of structures; principles of construction. *Twice a week; I, II; (1½ units or more). Time to be arranged.*
Professor TALBOT

¹ Each student taking the course must enroll in the lecture section.

METEOROLOGY
(See under GEOLOGY)

MILITARY SCIENCE

Professor and Commandant
FREDERICK WILLIAM POST, 1st Sergeant, U. S. A., retired. *Administrative Assistant*

1b-2b.—Theoretical Instruction.—First year basic course. For all freshmen men. *I, II; (½).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Military	1b	½	A	11	—	—	—	—	—	—	}
			B	—	11	—	—	—	—	—	
			C	—	—	11	—	—	—	—	
			D	—	—	—	11	—	—	—	
			E	—	—	—	—	11	—	—	
			F	3	—	—	—	—	—	—	
			G	—	3	—	—	—	—	—	
			H	—	—	3	—	—	—	—	
			I	—	—	—	3	—	—	—	
			J	—	—	—	—	3	—	—	

SECOND SEMESTER
Military 2b ½ Sections same as for 1a (first semester).

1a-2a-3a-4a. Practical Instruction.—First and second year basic course. *I, II; (½).*

Subject	No.	Credits	Section	FIRST SEMESTER (FRESHMEN)						Room	Instructor
				M	T	W	T	F	S		
Military	1a	½	(See NOTE)	4	4	4	4	—	—	Armory	

SECOND SEMESTER (FRESHMEN)
Military 2a ½ (See NOTE) 4 4 4 4 — — Armory

NOTE.—Freshmen must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions in the regiments will be made by the Commandant.

Subject	No.	Credits	Section	FIRST SEMESTER (SOPHOMORES)						Room	Instructor
				M	T	W	T	F	S		
Military	3a	½	(See NOTE)	4	4	4	4	—	—	Armory	

SECOND SEMESTER (SOPHOMORES)
Military 4a ½ (See NOTE) 4 4 4 4 — — Armory

NOTE.—Sophomores must reserve the four o'clock hour on the first four days of the week for Military. Assignments to battalions in the regiments will be made by the Commandant.

3b-4b. Theoretical Instruction.—Second year basic course. For all sophomores. *I, II; (½).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Military	3b	½	A	10	—	—	—	—	—	}	
			B	—	10	—	—	—	—		
			C	—	—	10	—	—	—		
			D	—	—	—	3	—	—		
			E	—	—	—	—	3	—		

SECOND SEMESTER
Military 4b ½ Sections the same as for 3a (first semester).

5b-6b. Theoretical Instruction.—First year advanced course. For juniors in the Reserve Officers' Training Corps. *Two hours each week. I, II; (½).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Military	5b	$\frac{1}{2}$	A	2	—	—	—	—	—		
			B	—	2	—	—	—	—		
			C	—	—	2	—	—	—		
			D	—	—	—	2	—	—		
			E	—	—	—	—	2	—		

SECOND SEMESTER

Military 6b $\frac{1}{2}$ Sections the same as for 5a (first semester).

7b-8b. Theoretical Instruction.—Second year advanced course. For seniors in the Reserve Officers' Training Corps. *Two hours each week. I, II; ($\frac{1}{2}$).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Military	7b	$\frac{1}{2}$	A	3	—	—	—	—	—		
			B	—	3	—	—	—	—		
			C	—	—	3	—	—	—		
			D	—	—	—	3	—	—		
			E	—	—	—	—	3	—		

SECOND SEMESTER

Military 8b $\frac{1}{2}$ Sections the same as for 7a (first semester).

Authorized Text-Books.—U. S. Army Infantry Drill Regulations; Army Regulations; Field Service Regulations; Guard Manual; Small-Arms Firing Regulations; Field Engineering (Beach); Hospital Drill Regulations; Manual of Military Training (Moss).

5a-6a-7a-8a. Practical Instruction.—Advanced course. For all juniors and seniors in the Reserve Officers' Training Corps. *Three hours each week. I, II; ($\frac{1}{2}$).*

Subject	No.	Credits	Section	FIRST SEMESTER (JUNIOR YEAR)						Room	Instructor
				M	T	W	T	F	S		
Military	5a	$\frac{1}{2}$	—	4	4	4	4	4	—	Armory	
Subject	No.	Credits	Section	SECOND SEMESTER (JUNIOR YEAR)						Room	Instructor
				M	T	W	T	F	S		
Military	6a	$\frac{1}{2}$	—	4	4	4	4	4	—	Armory	
Subject	No.	Credits	Section	FIRST SEMESTER (SENIOR YEAR)						Room	Instructor
				M	T	W	T	F	S		
Military	7a	$\frac{1}{2}$	—	4	4	4	4	4	—	Armory	
Subject	No.	Credits	Section	SECOND SEMESTER (SENIOR YEAR)						Room	Instructor
				M	T	W	T	F	S		
Military	8a	$\frac{1}{2}$	—	4	4	4	4	4	—	Armory	

MINERALOGY

(See GEOLOGY 5, 5a, 6, 7)

MINING ENGINEERING

HARRY HARKNESS STOEK, B.S., E.M., *Professor*

ELMER ALLEN HOLBROOK, S.B., E.M., *Assistant Professor*

CLINTON MASON YOUNG, S.B., E.M., *Assistant Professor, Mining Research*

ALFRED COPELAND CALLEN, E.M., M.S., *Associate*

1. Earth and Rock Excavation.—Explosives; blasting; boring; tunneling; shaft-sinking; coal-cutting; timbering and prospecting. *I; (3).*

Prerequisite: Chemistry 1a or 1b; Geology 13a and 13b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	1	3	—	11	—	9,10,11	—	11	—	206 T. B.	Callen

Mining Engineering

2. Mining Principles. Terminology; explosives and blasting; well and rock drilling; coal cutting; shaft sinking and tunneling; methods of working and timbering flat and inclined deposits. For students in courses other than mining. Of special interest to those taking advanced military work. *I* or *II*; (3).

Prerequisites: Chemistry 1a or 1b; junior standing.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	2	2	—	8	—	8	—	8	—	206 T. B.
										Instructor
										Stoek
										Callen
SECOND SEMESTER										
—	11	—	11	—	11	—	11	—	206 T. B.	Stoek
										Callen

4. Mining Methods.—Mining and timbering of bedded, vein, and placer deposits. *II*; (3).

Prerequisite: Mining 1.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	4	3	—	9	—	9	—	9	—	206 T. B.
										Instructor
										Stoek

5. Mine Ventilation.—Mine gases; safety lamps; mine ventilation; lighting and signaling; explosions and mine fires; rescue work and first aid. Laboratory work. *I*; (3).

Prerequisite: Chemistry 1a or 1b, 4; Physics 1a-1b, 3a-3b; Mining 4.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	5	3	—	9	—	9	—	—	—	206 T. B.
										Instructor
										Stoek
										Callen
										210 T. B.
										101 Min. L.

6. Mechanical Engineering of Mines.—Hoisting: ropes, cages, hoisting engines, and other appliances. Haulage: the different systems used underground and on the surface; the methods of loading and unloading; mine stables; transportation of workmen. Drainage of mines: mine dams, mine pumps. *II*; (2).

Prerequisite: Mechanical Engineering 1, or equivalent.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	6	2	—	—	8	—	8	—	—	206 T. B.
										Instructor
										Callen

8. Mine and Metallurgical Law, Administration, and Accounts.—Laws governing location, ownership, and policing of mines. Trade agreements, relations between employers and employees. Sociology. Accounts and cost sheets. *II*; (3).

Prerequisite: Mining 3 or 4 or Geology 2.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	8	3	—	8	—	8	—	8	—	206 T. B.
										Instructor
										Stoek
										Holbrook

9. Preparation of Coal and Ores.—History, principles, processes, machines; applications to dry coal preparation and coal washing. Breaking, sizing, and concentrating ores. Laboratory practise in coal washing. *I*; (3).

Prerequisite: Chemistry 5; Physics 3a-3b.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	9	3	—	—	—	10	—	10	—	206 T. B.
										Instructor
										Holbrook
										Min. L.

13. Utilization of Fuels.—The manufacture, handling, and utilization of wood, charcoal, peat, lignite, bituminous coal, anthracite, coke, petroleum, natural and artificial gas, and refractories in mining and metallurgical practise. *II*; (2).

Prerequisite: Junior standing.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	13	2	—	—	—	11	—	11	—	207 T. B.
										Instructor Holbrook

15. Principles of Mine Ventilation.—Mine ventilation, signaling, and lighting. *I*; (1).

Prerequisite: Physics 3a-3b; Mining 2 or 3 or 4.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	15	1	—	10	—	—	—	—	—	206 T. B.
										Instructor Callen

17. Problems.—Problems, library research, and reports on mining and metallurgical subjects. *I*; (1).

Prerequisite: Senior standing in mining engineering.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	17	1	—	10	—	—	—	—	—	206 T. B.
										Instructor Stoek

19. Ore and Coal Preparation.—Principles and machines used in breaking, pulverizing, sizing, classifying, and concentrating ores and mineral products. Wet and dry concentration. Practical limits of ore dressing. Principles applied in coal preparation. Laboratory practise in ore concentration. *I*; (3).

Prerequisite: Chemistry 5; Geology 13a and 13b or equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	19	3	—	—	—	10	—	10	—	206 T. B.
			Laboratory	1-4	—	—	—	—	—	Min. L.
										Instructor Holbrook

21. Mine Examination and Valuation.—The methods of examining, valuing, and reporting on mines, mining and metallurgical plants. Estimation and prospecting of mineral deposits. *I*; (2).

Prerequisite: Mining 2 or 3 or 4, or registration in Mining 2; Geology 13a and 13b, or equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	21	2	—	—	11	—	11	—	—	206 T. B.
										Instructor Stoek

41. Principles of Coal Plant Design.—Design of mine structures of wood, steel, and masonry, with drafting practise in design of coal tipples and general surface plant. *I*; (3).

Prerequisite: Civil Engineering 58, or equivalent.

FIRST SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	41	3	—	—	8,9	—	8,9	—	8,9	207 T. B.
										Instructor Holbrook

42. Coal Plant Design.—General layout; design; estimates for construction and specifications for coal mining plant. *II*; (2).

Prerequisite: Mining 41.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	42	2	—	9,10	—	9,10	—	9	—	207 T. B.
										Instructor Holbrook

43. Principles of Ore Plant Design.—Design of mine structures of wood, steel, and masonry, with drafting practise in design of rock houses, ore bins, and crushing plants. *I*; (3).

Prerequisite: Civil Engineering 58, or equivalent.

Mining Engineering

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	43	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

44. Ore Plant Design.—General layout; design; estimates for construction and specifications for ore mining plants. *II*; (2).

Prerequisite: Mining 43.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	44	2	—	9,10	—	9,10	—	9	—	207 T. B.	Holbrook

45. Principles of Mill and Smelter Design.—Flow sheets and structures of wood, steel, and masonry; drafting practise on individual designs. *I*; (3).

Prerequisite: Civil Engineering 58 or equivalent.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	45	3	—	—	8,9	—	8,9	—	8,9	207 T. B.	Holbrook

46. Mill and Smelter Design.—Flow sheets; design; estimates for construction, and specifications for concentrating plant or smelter. *II*; (2).

Prerequisite: Mining 45.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	46	2	—	9,10	—	9,10	—	9	—	207 T. B.	Holbrook

62. Mine Surveying.—The application of general surveying methods to mine work; the description and use of instruments employed underground and in connecting surface and underground surveys; the platting and use of mine maps; mineral land surveying; the theory and use of solar attachments; determination of the meridian. A surveying trip is made to neighboring mines, of which the estimated cost is \$10.00. *II*; (3).

Prerequisite: Civil Engineering 35.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	62	3	—	—	—	—	9-12	—	8-12	206 T. B.	Callen

64. Coal Mining Laboratory.—Different coals; their availability for crushing, dry preparation, washing, and briquetting. Complete commercial tests, using small commercial machines wherever possible; design of flow sheets; analysis of products. Estimation of probable costs. *II*; (3).

Prerequisite: Mining 9 or 19.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	64	3	—	—	8-12	—	—	—	—	Min. L.	Holbrook
			—	—	1-4	—	—	—	—		

66. Ore Concentration Laboratory.—Complete commercial wet and dry concentration tests on raw ores of lead, zinc, iron, etc. Amalgamation and cyanidation of a gold ore. Sampling, preparation, and analysis or assay of the products recovered. *II*; (3).

Prerequisite: Mining 9 or 19.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Min. E.	66	3	—	—	8-12	—	—	—	—	Min. L.	Holbrook
			—	—	1-4	—	—	—	—		

68. Mine Topography.—Stadia; application of topographic and railroad surveying to mining conditions. *II*; (1).

Prerequisite: Civil Engineering 27.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	68	1	—	—	—	—	1,2,3	—	—	207 T. B.
										Instructor Callen

90. Mining and Metallurgical Reports.—Review of mining and metallurgical literature; reports; technical writing. *II; (1).*

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Min. E.	90	1	—	1,2	—	—	—	—	—	206 T. B.
										Instructor Stoek

98. Thesis.—Individual investigation of a special mining subject; preparation of thesis giving review of the literature, the results of experimental work, and a general discussion of the subject. *II; (3).*

(Hours arranged when thesis is permitted, in accordance with regulations of the College of Engineering.)

99. Inspection Trip.—*I; (no credit).*

Prerequisite: Senior standing.

Courses for Graduates

Entrance on graduate work in mining engineering presupposes a full undergraduate course in that subject.

100. Seminar.—*Once a week; I, II; (1 unit)* Professor STOEK

101. Advanced Mining Methods.—Coal and ore fields of the United States; methods and economics of mining; utilization, marketing, storage, and transportation of coal and ores. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK

102. Advanced Preparation of Coal and Ores.—Detailed investigation and discussion of settling ratios; laws of crushing; sorting vs. sizing; specific mill and washing problems. *Twice a week; I, II; (1 unit). Time to be arranged.*

Assistant Professor HOLBROOK

103. The History of Miners' Organizations.—The effect of organizations on the development of mining practise. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor STOEK

104. Mining Reports.—The law of the apex; classification of coal and ore lands; conservation of mineral resources; mine examination and report. *Twice a week; I, II; (1 unit). Time to be arranged.* Professor STOEK, Assistant Professor HOLBROOK

105. Welfare Work and Education Among Mine Employees.—The organization and operation of mining institutes, night classes, welfare, mine rescue and first-aid work. *Twice a week; I, II; (1 unit). Time to be arranged.* Professor STOEK

MODERN LANGUAGES

(See ENGLISH LANGUAGE AND LITERATURE, GERMANIC LANGUAGES AND LITERATURE, and ROMANCE LANGUAGES AND LITERATURE)

MUNICIPAL AND SANITARY ENGINEERING

ARTHUR NEWELL TALBOT, D.Sc., D.Eng., *Professor*

MELVIN LORENIUS ENGER, M.S., C.E., *Associate Professor, Mechanics and Hydraulics*

Municipal and Sanitary Engineering

2. Water Supply Engineering.—Source of supply; hydraulics of wells; stream flow; impounding and storage reservoirs; conduits and pipe lines; pumps and pumping machinery; stand-pipes and elevated tanks; the distribution system; tests and standards of purity of potable water. Designing weekly. *I*; (4).

Prerequisite: Theoretical and Applied Mechanics 29, 10; Chemistry 1; Mechanical Engineering 1 or 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. & S. E.	2	4	F	11	—	11	1-4	11	—	208 E. H.	} Enger Babbitt
			G	9	—	9	—	9	—	208 E. H.	
				1-4	—	—	—	—	—	208 E. H.	

3. Sewerage.—Design and construction of sewerage systems; sanitary necessity of sewerage; separate and combined water carriage systems; surveys, and general plans; hydraulics of sewers; house sewage and its removal; relation of rainfall to storm water flow; determination of size and capacity of sewers; forms and strength of sewer appurtenances; modern methods of sewage disposal; estimates and specifications. Designing weekly. *II*; (3).

Prerequisite: Theoretical and Applied Mechanics 29, 10; Chemistry 1; Municipal and Sanitary Engineering 2.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. & S. E.	3	3	E	1-4	9	—	9	—	—	208 E. H.	} Babbitt
			F	—	8	—	8	—	8-11	208 E. H.	

6a-6b. Water Purification, Sewage Disposal, and General Sanitation.—Impurities in water supplies and methods and processes of their removal; sewage disposal by filtration, chemical precipitation, irrigation; representative purification plants; garbage collection and disposal; sanitary restrictions and regulations and general sanitation. Lectures; seminar work; drafting. *I*; (3); *II*; (2).

Prerequisite: Municipal and Sanitary Engineering 2, 3; Chemistry 1, 4, 10b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. & S. E.	6a	3	—	—	—	8	—	—	—	208 E. H.	} Talbot Babbitt
			—	—	1-4	—	1-4	—	—	314 E. H.	
Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. & S. E.	6b	2	—	8	—	—	—	—	—	208 E. H.	} Talbot Babbitt
			—	—	—	1-4	—	—	—	314 E. H.	

9. Hydraulic Design and Construction.—Reservoirs, dams, conduits, and waterways; hydraulic engineering problems. *II*; (2).

Prerequisite: Municipal and Sanitary Engineering 2.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
M. & S. E.	9	2	—	—	—	8-10	—	8-10	—	208 E. H.	Enger

98. Thesis.—Investigation or design of an engineering problem. *II*; (2).

Time to be arranged.

Professor TALBOT, Mr. BABBITT

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

Courses for Graduates

Entrance on graduate work in municipal and sanitary engineering presupposes a full undergraduate course in that subject.

102. Water Supply Engineering.—Water supply; general water-works construction; pumps and pumping; design of reservoirs and elevated tanks; water-works operation and the valuation of plants. *One to three times a week. I or II; (1 unit). Time to be arranged.*

Professor TALBOT

103. Sewerage.—Design and construction; systems; hydraulics of sewers; a study of run-off. *Once or twice a week; II; (1 unit). Time to be arranged.*

Professor TALBOT

106. Water Purification, Sewage Disposal, and General Sanitation.—The design, construction, and operation of water purification plants and of sewage disposal works; the study of existing plants; comparison of results and cost of construction and operation; experimental work on water filters and septic tanks; garbage disposal; general sanitation. *Once a week; II; (½ unit). Time to be arranged.*

Professor TALBOT

MUSIC

JOHN LAWRENCE ERB, F.A.G.O., *Director, University Organist*

GEORGE FOSS SCHWARTZ, A.M., B.Mus., *Assistant Professor, Theory and History of Music*

HENRI JACOBUS VAN DEN BERG, *Instructor, Piano*

ALBERT AUSTIN HARDING, B.Mus., *Instructor, Wind Instruments, Director of the Band*

EDNA ALMEDA TREAT, B.Mus., *Instructor, Piano*

EDSON WILFRED MORPHY, *Instructor, Violin*

HEBER DIGNAM NASMYTH, *Instructor, Voice*

FRANK TATHAM JOHNSON, *Instructor, Voice*

MABEL GENEVIEVE WRIGHT, A.B., B.Mus., *Instructor, Piano*

OLGA EDITH LEAMAN, *Instructor, Voice*

EDWARD EARLE SWINNEY, A.B., B.Mus., *Instructor, Public School Music*

1-2. History of Music.—I, II; (2).

Prerequisite: One year of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	1	2	—	—	11	—	11	—	—	104 U. H.	Schwartz
SECOND SEMESTER											
Music	2	2	—	Schedule the same as for 1 (first semester).							

3-4. Theory of Music (Harmony).—I, II; (2).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	3	2	A	—	—	11	—	11	—	104 U. H.	Schwartz
			B	—	2	—	2	—	—	104 U. H.	
			C	—	10	—	10	—	—	104 U. H.	
	4	2	—	—	3	—	3	—	—	104 U. H.	
SECOND SEMESTER											
Music	4	2	A	—	—	11	—	11	—	104 U. H.	
			B	—	2	—	2	—	—	104 U. H.	
	3	2	A	—	10	—	10	—	—	104 U. H.	
			B	—	3	—	3	—	—	104 U. H.	

5-6. Theory of Music (Harmony).—Continuation of 3-4, I, II; (3).

Prerequisite: Music 3-4.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor	
				M	T	W	T	F	S			
Music	5	3	—	2	—	2	—	2	—	104 U. H.	Schwartz	
	6	3	—	3	—	3	—	3	—	104 U. H.		
SECOND SEMESTER												
Music	5	3	—	3	—	3	—	3	—	104 U. H.		
	6	3	—	2	—	2	—	2	—	104 U. H.		

7-8. Counterpoint, Canon, and Fugue.—I, II; (3).

Prerequisite: Music 5.

Music

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	7	3	—	10	—	10	—	10	—	104 U. H.	Schwartz

SECOND SEMESTER
Music 8 3 Schedule same as for 7 (first semester)

9-10. General Theory and Analysis.—I, II; (2).

Prerequisite: Music 7-8.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	9	2	—	—	3	—	3	—	—	126 U. H.	Erb

SECOND SEMESTER
Music 10 2 — Schedule the same as for 9 (first semester).

11-12. Acoustics.—I, II; (1).

Prerequisite: Music 3 to 8 inclusive.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	11	1	—	—	—	—	2	—	—	201 U. H.	Erb

SECOND SEMESTER
Music 12 1 — Schedule the same as for 11 (first semester).

13-14. Musical Appreciation.—I, II; (1).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	13	1	—	—	—	3	—	—	—	126 U. H.	Erb

SECOND SEMESTER
Music 14 1 — Schedule the same as for 13 (first semester).

Public School Music

21a-21b. Ear Training, First Year.—Two hours a week; required of all music students. *I, II; (no credit).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	21a	—	—	9	—	9	—	—	—	126 U. H.	Swinney

SECOND SEMESTER
Music 21b — — Schedule the same as for 21a (first semester).

22a-22b. Ear Training, Second Year.—Two hours a week; required of students in the course in Music in the sophomore year. *-I, II; (1).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	22a	1	—	—	9	—	9	—	—	126 U. H.	Swinney

SECOND SEMESTER
Music 22b 1 — Schedule the same as for 22a (first semester).

23a-23b. Sight Singing, First Year.—Two hours a week; required of students in the course in Music in the sophomore year. *I, II; (no credit).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	23a	—	—	10	—	10	—	—	—	126 U. H.	Swinney

SECOND SEMESTER
Music 23b — — Schedule the same as for 22a (first semester).

24a-24b. Sight Singing, Second Year.—Two hours a week; required of students in the course in Music in the junior year. *I, II; (1)*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	24a	1	—	—	10	—	10	—	—	126 U. H.	Swinney

SECOND SEMESTER

Music 24b 1 — Schedule the same as for 24a (first semester).

25a-25b. Methods of Teaching.—Elements of theory, eye and ear training, the limitations of the child-voice, selection of material, pedagogical presentations, appreciation work for the high school. (Primarily for students preparing to teach music in the public schools.) *I, II; (4).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	25a	4	—	2	2	2	2	—	—	126 U. H.	Swinney

SECOND SEMESTER

Music 25b 4 — Schedule the same as for 25a (first semester).

27a-27b. Ensemble.—*I, II; (1). Time to be arranged.*

28a-28b. Sight Singing, Elementary.—One or two hours a week: designed especially for students from other schools and colleges. *I, II; (no credit).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Music	28a	—	—	7	—	7	—	—	—	126 U. H.	Swinney

SECOND SEMESTER

Music 28b — — Schedule the same as for 28a (first semester).

Piano¹

Mr. VAN DEN BERG, Miss TREAT, Miss WRIGHT

Hours to be arranged.

(In registering for the first semester use the first of the two hyphenated numbers attached to each course, and in registering for the second semester use the second number; for example, register for Music 41a for the first semester, and for Music 41b for the second semester.)

41a-41b. Preparatory Course in Piano, First Year.—*I, II; (no collegiate credit).*

41c-41d. Preparatory Course in Piano, Second Year.—*I, II; (no collegiate credit).*

41e-41f. Preparatory Course in Piano, Third Year.—*I, II; (no collegiate credit).*

42a-42b.—Piano, First Year.—*I, II; (4).*

43a-43b. Piano, Second Year.—*I, II; (4).*

44a-44b. Piano, Third Year.—*I, II; (4).*

45a-45b. Piano, Fourth Year.—*I, II; (4).*

46a-46b, 46c-46d, 46e-46f, 46g-46h. Piano.—Piano taken as a minor by students majoring in voice or violin. *I, II; (2).*

47a-47b, 47c-47d, 47e-47f. Piano.—For students from other departments of the university. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).²*

¹These courses include regular attendance in Orchestra or Choral Society unless a student is excused by the Director of the School of Music.

²See page 22.

Music

Voice¹

Mr. NASMYTH, Mr. JOHNSON, Miss LEAMAN

Hours to be arranged.

(See note, under courses in piano.)

51a-51b.—Preparatory Course in Voice, First Year.—*I, II; (no collegiate credit).*

51c-51d. Preparatory Course in Voice, Second Year.—*I, II; (no collegiate credit).*

51e-51f. Preparatory Course in Voice, Third Year.—*I, II; (no collegiate credit).*

52a-52b. Voice, First Year.—*I, II; (4).*

53a-53b. Voice, Second Year.—*I, II; (4).*

54a-54b. Voice, Third Year.—*I, II; (4).*

55a-55b. Voice, Fourth Year.—*I, II; (4).*

56a-56b, 56c-56d, 56e-56f, 56g-56h. Voice.—Voice taken as a minor by students majoring in piano or violin. *I, II; (2).*

57a-57b, 57c-57d, 57e-57f. Voice.—For students from other departments of the University. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).*²

Violin¹

Mr. MORPHY

Hours to be arranged.

(See note under courses in piano.)

61a-61b. Preparatory Course in Violin, First Year.—*I, II; (no collegiate credit).*

61c-61d. Preparatory Course in Violin, Second Year.—*I, II; (no collegiate credit).*

61e-61f.—Preparatory Course in Violin, Third Year.—*I, II; (no collegiate credit).*

62a-62b. Violin, First Year.—*I, II; (4).*

63a-63b. Violin, Second Year.—*I, II; (4).*

64a-64b. Violin, Third Year.—*I, II (4).*

65a-65b. Violin, Fourth Year.—*I, II; (4).*

66a-66b, 66c-66d, 66e-66f, 66g-66h. Violin.—Violin taken as a minor by students majoring in piano or voice. *I, II; (2).*

67a-67b, 67c-67d, 67e-67f. Violin.—For students from other departments of the University. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).*²

Violoncello¹

Mr. SCHWARTZ

Hours to be arranged.

(See note under courses in piano.)

71a-71b. Preparatory Course in Violoncello, First Year.—*I, II; (no collegiate credit).*

¹These courses include regular attendance in Orchestra or Choral Society unless a student is excused by the Director of the School of Music.

²See page 22.

71c-71d. Preparatory Course in Violoncello, Second Year.—*I, II; (no collegiate credit).*

71e-71f. Preparatory Course in Violoncello, Third Year.—*I, II; (no collegiate credit).*

72a-72b. Violoncello, First Year.—*I, II; (4).*

73a-73b. Violoncello, Second Year.—*I, II; (4).*

74a-74b. Violoncello, Third Year.—*I, II; (4).*

75a-75b. Violoncello, Fourth Year.—*I, II; (4).*

76a-76b, 76c-76d, 76e-76f, 76g-76h. Violoncello.—Violoncello taken as a minor by students majoring in piano, voice, or violin. *I, II; (2).*

77a-77b, 77c-77d, 77e-77f. Violoncello.—For students from other departments of the University. *I, II; (no credit, except in the College of Liberal Arts and Sciences under certain conditions).¹*

Organ²

Director **ERB**, Miss **TREAT**

Hours to be arranged.

Students desiring to take organ will be obliged to pass without conditions the entrance examination in piano. Under no circumstances will they be accepted if their piano work falls below the standard represented by this examination.

81-82. Organ, First Year.—*I, II; (4).*

84-85. Organ, Second Year.—*I, II; (4).*

86-87. Organ, Third Year.—*I, II; (4).*

88-89. Organ, Fourth Year.—*I, II; (4).*

83a-83b, 83c-83d, 83e-83f, 83g-83h. Organ.—Organ taken as a minor by students majoring in piano, voice, or violin, or by students from other departments of the University. *I, II; (2).*

Band and Recital

92a-92b.—Band Instruments.—*I, II; (no credit). Time to be arranged.*

Mr. **HARDING**

94a-94b. Recital Course in Practical Music.—(For seniors in Music 45a-45b, 55a-55b, 65a-65b, 88-89.) *I, II; (1). Time to be arranged.*

96a-96b. Band Instrumentation.—*I, II; (no credit). Time to be arranged.*

Mr. **HARDING**

97a-97b. Band Arranging.—*I, II; (no credit). Time to be arranged.*

Mr. **HARDING**

ORIENTAL LANGUAGES AND LITERATURE

ALBERT TEN EYCK OLMSTEAD, Ph.D., Professor

Courses for Advanced Undergraduates and Graduates

1a-1b.³ Elementary Hebrew.—Grammar and reading. The Book of Genesis. *I, II; (3).*

Prerequisite: Junior standing, including at least sixteen hours of college work in foreign languages.

¹ See page 22.

² These courses include regular attendance in Orchestra or Choral Society unless a student is excused by the Director of the School of Music.

³ It is expected that the courses 1a, 1b and 10 will be offered in alternate years.

Philosophy

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Oriental Languages	1a	3	—	3	—	3	—	3	—	311 L. H.	Olmstead
Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Oriental Languages	1b	3	—	3	—	3	—	3	—	311 L. H.	Olmstead

[10.¹ **Elementary Assyrian.**—Grammar, sign lists, and reading. *I, II*; (3). (Not given, 1917-18.)

Prerequisite: Oriental Languages 1a and 1b.]

PALEONTOLOGY

(See GEOLOGY 1a, 16, 18, 19, 20, 21)

PHILOLOGY

(See CLASSICS, ENGLISH LANGUAGE AND LITERATURE, GERMANIC LANGUAGES AND LITERATURE, and ROMANCE LANGUAGES AND LITERATURE)

PHILOSOPHY

(See also PSYCHOLOGY and EDUCATION)

ARTHUR HILL DANIELS, Ph.D., *Professor*

BOYD HENRY BODE, Ph.D., *Professor*

QUEEN LOIS SHEPHERD, Ph.D., *Instructor*

Major: Twenty hours from any courses offered by the department, including Philosophy 1, 2, 3, and 4, and one other advanced course. Six hours in psychology may be counted toward a major in philosophy.

Minors: Twenty hours in (a) psychology (at least six additional hours, if psychology is counted toward a major), and one other subject in the following list; or (b) any two subjects in the same group in the following list: (A) economics, history, political science, education, sociology; (B) English, French, German, Greek, Latin; (C) botany, chemistry, mathematics, physics, zoology. No course in any subject of the above groups may be counted for the minor requirement if it is excluded from the major requirement of its respective department.

Courses for Undergraduates

1. Logic.—The principles of reasoning; detection of fallacies; evidence. *I* or *II*; (3).

Prerequisite: One year of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	1	3	A, Lecture	1	—	1	—	—	—	228 N. H.	Bode Shepherd
			A, Quiz	—	—	—	—	1	—	320 L. H.	
			(Other hours to be arranged)								
			B, Lecture	10	—	10	—	—	—	315 U. H.	
			B, Quiz	—	—	—	—	10	—	317 L. H.	
			(Other hours to be arranged)								
Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			Lecture	2	—	2	—	—	—	100 Com.	Bode Shepherd
			Quiz	—	—	—	—	2	—	—	
			(Other hours to be arranged)								

¹It is expected that courses 1a-1b and 10 will be offered in alternate years.

2. Introduction to Philosophy.—Philosophic problems in their relation to the doctrine of evolution and in their bearing on conduct and religion. *II*; (3).

Prerequisite: Two years of university work.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	2	3	—	1	—	1	—	1	—	228 N. H.	Bode Shepherd

9. Political and Social Ethics.—Moral principles applied to political and social relations. *I*; (3).

Prerequisite: Two years of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	9	3	Lecture	10	—	10	—	10	—	202 L. H.	Daniels

Courses for Advanced Undergraduates and Graduates

3. History of Ancient and Medieval Philosophy.—*I*; (3).

Prerequisite: Three hours in philosophy; junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	3	3	—	11	—	11	—	11	—	113 L. H.	Daniels

4. History of Modern Philosophy.—From the Renaissance to the present time. *II*; (3).

Prerequisite: Three hours in philosophy; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	4	3	—	3	—	3	—	3	—	117 L. H.	Shepherd

7. Ethics.—The beginnings and growth of morality; the fundamental questions of ethical theory; social and economic problems of the present. *II*; (3).

Prerequisite: Three hours in philosophy; senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	7	3	—	11	—	11	—	11	—	113 L. H.	Daniels

11. Philosophy of Religion.—The philosophical interpretation of religious consciousness. Topic: God, revelation, inspiration, dogma, prayer, faith, immortality, the problem of evil; the relation of morality and religion. *II*; (2).

Prerequisite: Senior or graduate standing; six hours in psychology or philosophy, or in both.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	11	2	—	—	11	—	11	—	—	113 L. H.	Daniels

15. British Philosophers of the Eighteenth Century.—Locke, Berkeley, and Hume. *I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	15	3	—	(Arrange)						113 L. H.	Bode

16. Philosophy of Pragmatism.—*II*; (3).

Prerequisite: Philosophy 15.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Philosophy	16	3	—	(Arrange)						113 L. H.	Bode

Photography

18. Philosophers of the Nineteenth Century.—Philosophical tendencies in materialism, naturalism, idealism, and pragmatism. *I*; (3).

Prerequisite: Philosophy 2 or 3 or 4.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Philosophy	18	3	(Arrange)						113 L. H.	Shepherd

19. Rationalism and Religion in the Eighteenth and Nineteenth Centuries.—*I*; (3).

Prerequisite: Philosophy 2 or 3 or 4; junior standing.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Philosophy	19	3	(Arrange)						113 L. H.	Shepherd

Courses for Graduates

Students entering on graduate work in philosophy must have had a thoro course in the history of philosophy, a course in logic, and a general course in psychology.

103. Seminar in Ethics.—British ethics from Hobbes to Sidgwick. *Twice a week; I, II; (1 unit).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Philosophy	103	1 unit	(Arrange)						107 L. H.	Daniels

107a-107b-107c. History of Philosophy.—a: Plato and Aristotle. *Twice a week; (1 unit).* b: Descartes, Spinoza, and Leibnitz. *Twice a week; (1 unit).* c: Kant and Schopenhauer. *Twice a week. (1 unit); I, II* (The subjects in 1917-18 will be determined by the needs of the students registered.)

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Philosophy	107	1 unit	(Arrange)						107 L. H.	Daniels

108a-108b-108c. Seminar in Contemporary Philosophy.—a: Idealism. *Twice a week; (1 unit).* b: Realism and pragmatism. *Twice a week; (1 unit).* c: The philosophy of Bergson. *Twice a week; (1 unit).* *I, II.* (The subjects in 1917-18 will be determined by the needs of the students registered.)

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Philosophy	108	1 unit	(Arrange)						107 L. H.	Bode

PHOTOGRAPHY

ARTHUR GRENVILLE ELDRIDGE, *Instructor*

1-2. The Principles and Practise of Photography.—For advanced students who use photography in connection with their special subjects. Lenses, cameras; plates and films; exposure; development; printing; copying; positives; landscape, architectural, and scientific photography; speed work; color photography. Lectures and demonstrations; each student is required to produce a stated amount of work covering the processes treated. *I, II; (Once a week, no credit).*

Prerequisite: Junior standing and the consent of the instructor.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Photography	1	—	—	2-5	—	—	—	—	404 P. L.	Eldredge

(Other hours to be arranged)

Subject	No. Credits	Section	SECOND SEMESTER					
			Schedule the same as for 1 (first semester).					
Photography	2	—						

PHYSICAL TRAINING FOR MEN

GEORGE A HUFF, B.S., *Director*HARRY LOVERING GILL, *Associate, Track*RALPH R JONES *Associate, Basket Ball*ROBERT CARL ZUPPKE, A.B., *Associate, Football*ROY NEWTON FARGO, B.S., *Director of the Men's Gymnasium*EDWARD JOHN MANLEY, *Instructor, Swimming*WALTER EVANS, *Assistant*SAMUEL BILIK, *Assistant*

1-2. Gymnasium Practise.—Two hours' gymnasium drill each week. (Required of freshmen. First semester given in conjunction with 1a below.) Begins Monday, September 24. *I*; ($\frac{1}{2}$): *II*; (1).

NOTE.—(a) Freshmen should register in both 1 and 1a the first semester, and must report to 1a one hour per week until lectures are completed, and to 1 two hours a week throughout the semester. During the first six weeks the sections in 1 will be held the first hour during the week called for on the schedule, except section H, which will be held the second hour during the week.

(b) Students registered in Gymnasium 1 must supply themselves with proper gymnasium attire during registration week. Information regarding gymnasium suits may be obtained at the men's gymnasium.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
P. T.	1	$\frac{1}{2}$	A	10	—	—	—	10	—	Gym.	Fargo
			B	11	—	—	—	11	—		
			C	—	—	—	2	2	—		
			D	—	—	3	—	3	—		
			E	—	10	—	10	—	—		
			F	—	11	—	11	—	—		
			G	—	2	—	2	—	—		
			H	—	3	—	3	—	—		

SECOND SEMESTER
P. T. 2 1 Schedule and sections the same as for 1 (first semester).

NOTE.—All freshmen must be able to swim fifty yards before receiving credit in P. T. 2.

1a. Personal Hygiene.—Six lectures by the Dean of Men. Required in conjunction with Physical Training 1. These lectures begin Monday, September 24, 1917. *I*; (*first six weeks*).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
P. T.	1a	$\frac{1}{2}$	A	—	—	—	—	11	—	100 Com.	Clark
			B	—	—	—	11	—	—	204 Com.	
			C	4	—	—	—	—	—	100 Com.	
			D	—	3	—	—	—	—	100 Com.	
			E	—	—	4	—	—	—	100 Com.	
			F	—	—	—	4	—	—	100 Com.	
			G	—	—	—	—	4	—	100 Com.	

3-4. Heavy Apparatus Work.—*I, II*; (1).

Prerequisite: Physical Training 1-2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
P. T.	3	1	—	4	—	4	—	4	—	Gym.	Fargo
SECOND SEMESTER											
P. T.	4	1	—	Schedule the same as for 3 (first semester).							Fargo

Physical Training

PHYSICAL TRAINING FOR WOMEN

LOUISE FREER, A.B., B.S., *Director*

VERNA BROOKS, A.B., *Instructor*

NELLIE EILEEN BUSSELL, A.B., *Instructor*

ANNA LUE HUGHITT, *Instructor*

CAROLINE RUTH MORRIS, A.B., *Assistant*

ROSA-LEE GAUT, B.Mus., *Assistant*

7a-7b. Practise.—Class work consisting of light gymnastics, gymnastic dancing, games, personal hygiene, and corrective work. Required of freshmen. *I, II; (1).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	7a	1	A	—	9	—	9	—	9	W. B.	} Freer Hughitt Brooks Bussell Morris
			B	9	—	9	—	9	—	W. B.	
			C	—	10	—	10	10	—	W. B.	
			D	11	—	11	—	11	—	W. B.	
			E	11	—	11	—	11	—	W. B.	
			F	2	—	2	—	2	—	W. B.	
			G	2	—	2	—	2	—	W. B.	
			H	3	—	3	3	—	—	W. B.	
			I	—	3	—	3	3	—	W. B.	

SECOND SEMESTER

P. T. 7b 1 Sections and schedule the same as for 7a (first semester).

8a-8b. Practise.—(Continuation of Physical Training 7a-7b). Second year elective. *I, II; (1).*

Prerequisite: Physical Training 7a-7b.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
P. T.	8a	1	A	—	9	—	9	—	9	W. B.	Morris
			B	10	—	10	—	10	—	W. B.	Brooks
			C	3	—	3	—	3	—	W. B.	Hughitt
			D	4	4	—	4	—	—	W. B.	Bussell

SECOND SEMESTER

P. T. 8b 1 Sections and schedule the same as for 8a (first semester).

9. Hygiene.—Required of freshmen. *I; (1).*

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	9	1	—	4	—	—	—	—	—	—	—

10a. Teachers' Course.—Third year. Theory of play; development of the child through play; playground management; folk dances, singing games, and games of skill. Theory, one hour; lectures, reports, outside reading. Practise teaching in the gymnasium and in the public schools. *I; (1).*

Prerequisite: Physical Training 7a-7b; 8a-8b, and 9; Psychology 1.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
<i>P. T.</i>	10a	1	—	—	—	—	—	—	10-12	W. B.	Bussell

10b. Teachers' Course.—(Continuation of Physical Training 10a). Theory and practise of gymnastic teaching. The school festival. *II; (1).*

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
P. T.	10b	1	—	—	—	—	—	—	10-12	W. B.	Bussell

11a-11b. Teachers' Course.—Fourth year. A. Anthropometry, massage, corrective gymnastics. B. First Aid. *I, II; (no credit). Time to be arranged.*

Miss HUGHITT

Prerequisite: Physical Training 10a-10b.

12a-12b. Esthetic and Interpretative Dancing.—Exercises in technic. *I, II; (no credit).*

Prerequisite: Physical Training 7a-7b.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	12a	—	—	—	—	5	—	—	W. B.	Brooks

SECOND SEMESTER										
P. T.	12b	—	—	Schedule same as for 12a (first semester).						

13a-13b. Advanced Esthetic and Interpretative Dancing.—Technic; pantomime. *I, II; (no credit).*

Prerequisite: 8a-8b, 12a-12b.

FIRST SEMESTER										
Subject	No. Credits	Section	M	T	W	T	F	S	Room	Instructor
P. T.	13a	—	—	5	—	—	—	—	W. B.	Hughitt

SECOND SEMESTER										
P. T.	13b	—	—	Schedule same as for 13a (first semester).						

PHYSICS

ALBERT PRUDEN CARMAN, D.Sc., *Professor*

CHARLES TOBIAS KNIPP, Ph.D., *Associate Professor*

FLOYD ROWE WATSON, Ph.D., *Associate Professor, Experimental Physics*

JAKOB KUNZ, Ph.D., *Associate Professor, Mathematical Physics*

WILLIAM FREDERICK SCHULZ, Ph.D., *Assistant Professor*

ELMER HOWARD WILLIAMS, Ph.D., *Associate*

SEBASTIAN KARRER, A.M., *Instructor*

EARLE HORACE WARNER, A.M., *Instructor*

CHARLES FRANCIS HILL, A.M., *Assistant*

CARL ELI PIKE, B.S., *Assistant*

ROY ANDREW NELSON, B.S., *Assistant*

BIRD RICHARD STEPHENSON, A.M., *Assistant*

ELEANOR FRANCES SEILER, A.M., *Assistant*

EDWARD COURTLAND FRITTS, B.S., *Assistant*

Physics 7a-7b and 8a-8b are recommended to students not specializing in mathematics, chemistry, or engineering. For undergraduate students taking advanced work or a major in physics, the following outline of work is suggested:

Freshman year: Trigonometry (Math. 4) and Chemistry.

Sophomore year: Physics 1a-1b, 3a-3b, or Physics 7a-7b, 8a-8b.

Junior year: Physics 15, 16, 17, 23, or 24.

Senior year: Physics 4a-4b, 14a-14b, 20, 22, 25, 30, or 31.

Introductory Courses for Undergraduates

1a-1b. General Physics.—Lectures with class-room demonstration; recitations; written exercises. (For sophomores in engineering, mathematics, physics, and chemistry.) *I; (3): II; (2).*

Prerequisite: Registration in Physics 3a-3b; freshman mathematics.

Physics

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	1a	3	Lecture I	9	—	9	—	—	—	100 P. L.	Carman
			Lecture II	11	—	11	—	—	—	100 P. L.	Carman
			Quiz	—	—	—	—	—	—	—	—
			C	—	—	—	—	11	—	—	—
			D	—	—	—	—	11	—	—	—
			E	—	—	—	—	11	—	104 P. L.	Carman
			F	—	—	—	—	9	—	108 P. L.	Schulz
			G	—	—	—	—	9	—	302 P. L.	Warner
			K	—	—	—	—	9	—	305 P. L.	Nelson
			L	—	—	—	—	9	—	306 P. L.	Stephenson
			M	—	—	—	—	11	—	403 P. L.	Pike
			N	—	—	—	—	11	—	406 P. L.	—
			O	—	—	—	—	9	—	—	—
			P	—	—	—	—	9	—	—	—
			Q	—	—	—	—	11	—	—	—

SECOND SEMESTER

Physics 1b 2 — Sections and schedule the same as for 1a (first semester).

3a-3b. Physical Measurements.—Laboratory experiments; quizzes in connection with Physics 1a-1b. *I, II; (2).*

Prerequisite: Physics 1a-1b or registration therein.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	3a	2	C	—	10-12	—	10-12	—	—	305 P. L.	—
			D	—	10-12	—	10-12	—	—	312 P. L.	—
			E	—	8-10	—	8-10	—	—	403 P. L.	—
			F	—	—	2-4	—	—	10-12	406 P. L.	Schulz
			G	—	2-4	—	2-4	—	—	—	Warner
			L	10-12	—	10-12	—	—	—	—	Nelson
			M	2-4	—	—	—	2-4	—	—	Stephenson
			N	2-4	—	—	—	2-4	—	—	Pike
			O	—	10-12	—	10-12	—	—	—	—
			P	—	8-10	—	8-10	—	—	—	—
			Q	—	2-4	—	2-4	—	—	—	—
			X	—	10-12	—	10-12	—	—	—	—

SECOND SEMESTER

Physics 3b 2 — Sections and schedule the same as for 3a (first semester).

7a-7b. General Physics.—Lectures; class-room demonstrations; recitations. (For students in arts and science.) *I, II; (2½).*

Prerequisite: Mathematics 4, or registration therein; registration in Physics 8a-8b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	7a	2½	Lecture	—	11	—	11	—	—	119 P. L.	Watson
			A, Quiz	—	—	—	—	9	—	208 P. L.	Williams
			B, Quiz	—	—	—	—	10	—	208 P. L.	Hill
											Seiler

SECOND SEMESTER

Physics 7b 2½ — Sections and schedule the same as for 7a (first semester).

8a-8b. Introductory Laboratory Physics.—Physical measurements. *I, II; (2½).*

Prerequisite: Registration in Physics 7a-7b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	8a	2½	A	10,11	—	10,11	—	—	—	212, 208 P. L.	Williams
			B	2,3	—	2,3	—	—	—	212, 302 P. L.	Hill
			C	8,9	—	8,9	—	—	—	212, 305 P. L.	Seiler

SECOND SEMESTER

Physics 8b 2½ — Sections and schedule the same as for 8a (first semester).

9a-9b. General Physics.—Lectures; class-room demonstrations; recitations. (For students in architecture.) *I, II; (2).*

Prerequisite: Mathematics 4; registration in Physics 10a-10b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	9a	2	Lecture	—	11	—	11	—	—	119 P. L.	} Watson Williams Hill Seiler
			A, Quiz	—	—	—	—	9	—	119 P. L.	
			B, Quiz	—	—	—	—	11	—	208 P. L.	

SECOND SEMESTER

Physics 9b 2 — Sections and schedule the same as for 9a (first semester).

10a-10b. Introductory Laboratory Physics.—Physical measurements. *I, II; (2).*

Prerequisite: Registration in Physics 9a-9b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	10a	2	A	—	8,9	—	8,9	—	—	212, 302 P. L.	Williams Hill Seiler
			B	—	8,9	—	8,9	—	—	119, 302 P. L.	
										305 P. L.	

SECOND SEMESTER

Physics 10b 2 — Sections and schedule the same as for 10a (first semester).

Intermediate Courses

15. Electricity and Magnetism.—Recommended to students in non-technical courses who wish a knowledge of electricity and magnetism beyond the course in general physics. Two recitations or lectures and one three-hour laboratory exercise weekly. Brooks and Poyser: *Electricity and Magnetism. I; (3).*

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	15	3	—	9	—	9	—	1-4	—	112, 208 P. L.	Knipp

16. Heat.—Fundamental heat phenomena, the mechanical theory of heat and elementary thermodynamics. Laboratory experiments in thermometry, calorimetry, vapor pressure, expansion of bodies, transmission of heat, and mechanical equivalent, and method of measurement of high temperatures. *I; (3).*

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	16	3	—	—	9	—	9	—	9-12	208, 213 P. L.	Watson Fritts

17. Light.—Reflection, refraction, interference, diffraction, and polarization; the theory and use of optical instruments; lectures and laboratory. For students in general physics, but also adapted to those who wish to learn the use of the refractometer, telescope, microscope, polarising microscope, polarimeter, saccharimeter, spectrometer, and interferometer. Houstoun: *Treatise on Practical Light. II; (3).*

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Physics	17	3	—	2	—	2	—	2-5	—	301 P. L. 303 P. L.	Schulz Warner

Physics

[18. **Teachers' Course.**—Discussion of text-books, reference books, laboratory manuals, apparatus ordering, and methods of conducting work in physics. Manipulative work with glass and apparatus. Discussion of selected topics in advanced general physics. *II*; (3). (Not given, 1917-18.)

Prerequisite: A course in general physics, or experience in teaching.]

Courses for Undergraduates and Graduates

4a-4b. Electrical and Magnetic Measurements.—Exact electrical and magnetic measurements with accompanying theory. First semester: the more refined and special methods of measuring very high and very low resistances; galvanometers both aperiodic and ballistic; the measurement of electric currents and quantity; the comparison of capacities. Second semester: the absolute determination of capacity; the determination of the damping factor of a ballistic galvanometer; circuits containing resistance and self-induction; classical methods for the measurement of self and mutual induction; the magnetic properties of iron; plotting of curves and determination of hysteresis losses. Work with various types of potentiometers. *I, II*; (2).

Prerequisite: Physics 1a-1b, 3a-3b, or 7a-7b, 8a-8b; Mathematics 7, 9.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Physics	4a	2	L	—	1-4	—	1-4	—	112 P. L.	Knipp
			M	9-12	—	—	—	9-12	104 P. L.	Karrer
			N	—	—	1-4	—	1-4	108 P. L.	—

					SECOND SEMESTER						
Physics	4b	2	—	Sections and schedule the same as for 4a (first semester).							

14a. Introduction to Theoretical Physics.—Dynamics. First course in theoretical physics, intended to put in systematic form the fundamental facts and concepts of motion, mass, and force, with problems from pure and applied physics. For the student of general science as well as for students of physics and mathematics. Recitations; problems; lectures. Jean: *Theoretical Mechanics. I*; (3).

Prerequisite: Physics 1a-1b, 3a-3b, or 7a-7b, 8a-8b; Mathematics 8 or 7 and 9.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Physics	14a	3	—	8	—	8	—	8	208 P. L.	Carman

20. Light.—Special phenomena; modern theories; readings in texts of Drude, Wood, and Preston. Lectures; recitations. *I*; (2).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b; Mathematics 7 and 9, or 8.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Physics	20	2	—	4	—	—	—	4	301 P. L.	Schulz

22. Advanced Light Measurements.—Wavelength determinations with gratings, echelons, and interferometers, spectroscopic work, Zeeman effect, polarimetric analysis, determination of resolving power of instruments, photometry and spectrophotometry. *I*; (2 to 5).¹

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Physics	22	2-5 ¹	—	2-5	—	2-5	—	—	301 P. L.	Schulz
									401 P. L.	Warner

¹In registering for a course with variable credit hours, a student must put down on his study-list, not the possible hours, as shown here, but the number of hours for which he intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

23. Sound.—The phenomena of sound, its origin, propagation, velocity, interference, and diffraction; the vibrations of strings and organ pipes and the physical theory of music and speech. Lectures, recitations, laboratory. *II*; (3).

Prerequisite: Physics 1a-1b, 3a-3b; or 7a-7b, 8a-8b.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Physics	23	3	—	—	9	—	9	—	9-12	208 P. L. 213 P. L.	Watson Fritts

24. Properties of Matter.—Gravitation, elasticity, capillarity, and other general properties of matter. Poynting and Thomson: *Properties of Matter*. Recitations and lectures. *II*; (2).

Prerequisite: Physics 1 and 3, or 7 and 8; Mathematics 7 and 9, or 8.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Physics	24	2	—	—	10	—	10	—	208 P. L.	Williams

27. Fundamental Physical Measurements.—An advanced laboratory course in measurements of length, mass, time and of determinations of gravitation, elasticity, surface tension, viscosity, etc. *II*; (1).

Prerequisite: Course in general physics.

Subject	No.	Credits	Section	SECOND SEMESTER					Room	Instructor
				M	T	W	T	F		
Physics	27	1	—	—	—	—	1-4	—	313 P. L.	Williams

30. Introduction to Theoretical Electricity.—Electrical and magnetic phenomena discussed with calculus methods. Magnetism, electrostatics, electrolysis, thermoelectricity, electromagnetics, varying currents, alternating currents, units, electromagnetic radiation, conduction through gases, radioactivity, and electrons. (For advanced students in physics, chemistry, mathematics, and engineering.) Lectures; recitations; demonstrations. Starling: *Electricity and Magnetism*. *II*; (3).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	30	3	—	—	9	—	9	—	0	104 P. L.	Knipp

31a-31b. Special Problems in Advanced Physical Measurements.—*I*, *II*; (2 or 3).¹

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	31a	2 or 3 ¹	—	(Arrange)						}	Carman
				SECOND SEMESTER							Knipp
				(Arrange)							Watson
											Schulz
											Williams
Physics	31b	2 or 3 ¹	—								

Courses for Graduates

The prerequisite for graduate work in physics is a college course in general physics with a year's laboratory course in introductory physical measurements. The student who is to do major work in physics should also have had additional courses in physics or teaching experience, unless the training in his minor subjects, mathematics or chemistry, has been strong and complete. He should also have a knowledge of French and German sufficient to use references in these languages.

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Physics

The courses named below are those open for candidates for the Master's or Doctor's degree. A large part of the last year's work of the candidate for the Doctor's degree is investigational in either experimental or theoretical physics. In addition to these major graduate courses, the courses in elementary dynamics, heat, light, electrical measurements, and introductory electrical theory, are arranged with certain additions for graduate credit. The "intermediate" courses on heat, light, and electricity and magnetism (Physics 15, 16, 17, 24), may be offered by students making a minor in physics, and with certain limitations by students in their first year of graduate work for major credit.

104a-104b. Selected Problems in Electrical Measurements.—First Semester: measurement of very high and very low resistances, aperiodic and ballistic galvanometers of the magnetic needle and suspended coil types; damping factor and critical damping resistance; electric current and quantity; comparison of capacities; absolute determination of capacity; the Dolezalek quadrant electrometer; dielectric constants; the measurement of v and e/m for cathode rays; positive electricity; and special uses of the potentiometer. Second Semester: refined methods of measuring properties of iron; plotting of hysteresis curves, and the determination of hysteresis losses, etc. *I, II; ($\frac{3}{4}$ unit).*

NOTE.—104a is recommended for graduate students in chemistry.

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Physics	104	$\frac{3}{4}$ unit	—	(Arrange)						8-11 8-11	112 P. L. Knipp

121. Recent Advances in Physics and the Electron Theory.—A series of demonstration lectures, in which members of the class will take turns in assisting. The universal occurrence of electrons; properties of the electron, and of the gaseous ion; determination of e/m and v of the electron, and of the ion; use of positive rays (kanal strahlen) in gas analysis; color effects of electrons, of ions, and of retrograde rays in residual hydrogen, helium, neon and argon; determination of the elementary charge of the electron by means of the fog method, by radioactivity. *II; ($\frac{1}{4}$ unit).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	121	$\frac{1}{4}$ unit	—	—	4-6	—	—	—	—	119 P. L.	Knipp

123. Sound.—Wave motion; forced vibrations; the velocity and energy relations of sound waves; resonance; vibrations of strings and organ pipes. *Three times a week; II; ($\frac{3}{4}$ unit).*

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Physics	123	$\frac{3}{4}$ unit	—	11	—	11	—	11	—	208 P. L.	Watson
(or arrange)											

124. Conduction of Electricity Through Gases.—The classical experiments relating to discharge phenomena. In the second semester an original problem is assigned. Laboratory, collateral reading; discussion. *Three times a week; I, II; (1 to 2 units). Time to be arranged.* Associate Professor KNIPP

126. Physics Colloquium.—Weekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems in physics. Attendance is expected of all graduate students. *Once a week; I, II; (no credit).*

Subject	No.	Credits	Section	BOTH SEMESTERS						Room	Instructor
				M	T	W	T	F	S		
Physics	126	—	—	—	—	—	—	6:45	—	—	—
8:00 P. M.											

127a. Problems of Present Theoretical Investigations in Physics.—The fundamental laws of nature, the principle of least action, equipartition of energy, entropy and probability, laws of radiation, and the energy quantum will be treated by means of the present literature. *I, II; ($\frac{1}{2}$ unit).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Physics	127a $\frac{1}{2}$ unit	—	4	—	—	—	4	—	306 P. L.	Kunz

[127b. Electron Theory.—(Physical part, Seminar.) The method of physical intuition is used, avoiding deeper mathematical analysis. The Zeeman and corresponding electric phenomena; electro and magneto-optics; emission and absorption spectra; dispersion; photoelectricity; phosphorescence; chemical action of light and electrons; electron theory of metals and of magnetism; constitution of the atom. Of special interest to students in chemistry and general science. *Twice a week; II; (1 unit).* (Not given, 1917-18.)]

131. Investigation of Special Problems.—Advanced laboratory or design and calculation. A problem worked out with the advice and direction of the instructor. *Two to four times a week; I, II; (1 to 2 units).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Physics	131 1 to 2 units	—	(Arrange)							Carman Knipp Watson Kunz Schulz Williams

132. Mathematical Physics.—Special phases in theoretical physics.

(a). **Dynamics.**—Newton's equations, general methods of integration, potential-theory, potential of the ellipsoid, application to celestial mechanics, the principles of least constraint, of virtual work, of D'Alembert, of Hamilton; special problems of hydrodynamics and of electricity. *Three times a week; I, II; (1 unit).*

NOTE.—Either 132a or 132e will be given in 1917-18, after consultation with students.

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Physics	132a 1 unit	—	10	—	10	10	10	—	306 P. L.	Kunz

(b). **Electrodynamics.**—The potential theory applied to electrical and magnetic polarization; spherical harmonics; images and inversion; conjugate functions; elliptic coordinates and integrals; magnetic actions of currents; determination of coefficients of capacity; self and mutual induction; absolute measurements; Maxwell's theory with some applications in optics. Lectures; collateral reading. *Four times a week; I, II; (1 unit).* (Not given, 1917-18.)]

(c). **Thermodynamics and Kinetic Theory of Matter.**—The two fundamental principles developed and applied to various physical and chemical phenomena; the theory of chemical equilibrium; the Nernst theorem; the direct method of Carnot's cycle together with the method of the thermodynamic potentials and the derived functions; Maxwell's theory of the distribution of velocities in a gas; Boltzmann's H theory; the theory of radiation; Planck's theory of quanta. *I, II; 1 to 2 units.* (Not given, 1917-18.)]

(d). **Theory of Electrical Oscillations, Spherical and Cylindrical Harmonics.**—The differential equation of diffusion of electricity, heat, and matter will be applied to various phenomena of theoretical and technical importance, such as transatlantic cable. Electrical oscillations along wires, long distance telephony, vibrations

Physiology

from a Hertz oscillator, from the antennæ, propagation of electrical waves over the surface of the earth and their absorption, reflection of electrical waves from planes, cylinders and spheres, and diffraction of waves from the principal topics of this course. The theory of spherical and cylindrical harmonics will be used in the solution of various problems. *I, II; (1 unit).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Physics	132d 1 unit	—	—	11	—	11	—	—	306 P. L.	Kunz

(e). **Theory of Elasticity.**—In the first part of the course special problems of oscillations will be treated, involving the use of homogeneous integral equations. Vibrations of membranes, bars, and plates. In the second part the general theory of elasticity will be developed leading up to the present theoretical problems in this field. *I, II; (1 unit).*

NOTE.—Either 132a or 132e will be given in 1917-18, after consultation with students.

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Physics	132e 1 unit	—	10	—	10	10	10	—	306 P. L.	Kunz

133. Seminar.—*Three or five times a week; I, II; (1 to 3 units).*

Subject	No. Credits	Section	BOTH SEMESTERS						Room	Instructor
			M	T	W	T	F	S		
Physics	133 1 to 3 units	—	(Arrange)							<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 5px;">}</div> <div> Carman Knipp Watson Kunz Schulz </div> </div>

PHYSIOLOGY

WILLIAM EDWARD BURGE, Ph.D., *Assistant Professor*

ALMA JESSIE NEILL, A.B., A.M., *Assistant*

RICHARD ASHMAN, B.S., A.M., *Assistant*

Major: 20 hours made up of any courses offered in the department exclusive of Physiology 4.

Minors: 20 hours in bacteriology, botany, chemistry and zoology.

1. Histology.—A microscopic study of the fundamental mammalian tissues. Continued in Physiology 8. *I; (3).*

Prerequisite: Two years of university work.

Subject	No. Credits	Section	FIRST SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Physiology	1 3	Lecture	—	—	—	—	8	—	413 N. H.	Burge
		Laboratory	—	8,9	—	8,9	—	—	413 N. H.	Ashman

2. Advanced Experimental Physiology.—Circulation, respiration, secretion, digestion, and metabolism. Lectures; laboratory. *II; (5).*

Prerequisite: Physiology 3.

Subject	No. Credits	Section	SECOND SEMESTER						Room	Instructor
			M	T	W	T	F	S		
Physiology	2 5	Lecture	—	4	—	4	—	—	229 N. H.	Burge
		Laboratory	—	10,11	—	10,11	—	10,11	413 N. H.	Ashman Neill

3. Elementary Experimental Physiology.—Nerve and muscle. Lectures; demonstrations; laboratory. *I; (2).*

Prerequisite: Two years of university work.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Physiology	3	2	Lecture	—	4	—	—	—	—	229 N. H.	Burge
			Laboratory	10,11	—	—	—	—	—	413 N. H.	Ashman

4. General Physiology, Chemical and Experimental.—Lectures; demonstrations; recitations; laboratory. *I* or *II*; (5).

Prerequisite: One year of university work including five hours in botany or zoology, and five hours in chemistry.

EITHER SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Physiology	4	5	Lecture	—	9	—	—	—	9	229 N. H.	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 5px;">}</div> <div> Burge Ashman Neill </div> </div>
			A,Laboratory	—	—	8,9	—	8,9	—	413 N. H.	
			B,Laboratory	—	—	10,11	—	10,11	—	413 N. H.	
			C,Laboratory	—	—	1,2	—	1,2	—	413 N. H.	
			D,Laboratory	—	—	3,4	—	3,4	—	413 N. H.	
			A,Quiz	8	—	—	—	—	—	229 N. H.	
			B,Quiz	—	—	—	4	—	—	249 N. H.	
			C,Quiz	1	—	—	—	—	—	247 N. H.	

5. Physiology of Nutrition.—Utilization of food material by the body in health under various conditions and in disease. Lectures; demonstrations. *II*; (2).

Prerequisite: Physiology 4 or equivalent.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Physiology	5	2	Lecture	—	—	8	—	8	—	249 N. H.	Burge

6. Physiology of the Nervous System.—The function of the principal motor and sensory tracts of the mammal. *I*; (3).

Prerequisite: Two years of university work.

FIRST SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Physiology	6	3	Lecture	9	—	—	—	—	—	415	Burge
			Laboratory	—	10,11	—	10,11	—	—	401	Ashman

7. Investigation.—*I* or *II*; (5).

EITHER SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Investigation	7	5	—	—	—	—	—	—	—	416	Burge

8. Histology.—Microscopic anatomy of the organs. Lectures; laboratory. *II*; (3).

Prerequisite: Physiology 1.

SECOND SEMESTER										Room	Instructor
Subject	No.	Credits	Section	M	T	W	T	F	S		
Physiology	8	3	Lecture	8	—	—	—	—	—	414 N. H.	Burge
			Laboratory	—	8,9	—	8,9	—	—	414 N. H.	Ashman

Courses for Graduates

100. Physiology of Secretion and Excretion.—A study in the method of procedure in collecting the various secretions of mammals and a study of the factors controlling the flow of these juices. *Once a week. I; (¾ unit). Time to be arranged.*

Assistant Professor BURGE

101. Journal Club.—Review of literature and discussion of investigation being carried on in the department. *Once a week; I, II; (¼ unit). Time to be arranged.*

Members of the staff

102. Research.—Three times a week; *I, II; (1 or 2 units). Time to be arranged.*

Assistant Professor BURGE

POLITICAL SCIENCE

(See also ECONOMICS, HISTORY, and SOCIOLOGY)

JAMES WILFORD GARNER, Ph.D., *Professor*JOHN ARCHIBALD FAIRLIE, Ph.D., *Professor*JOHN MABRY MATHEWS, Ph.D., *Associate Professor*RUSSELL MCCULLOCH STORY, Ph.D., *Associate*ROBERT EUGENE CUSHMAN, A.B., *Instructor*

Major: Twenty hours from any courses offered by the department. A major may include three hours of constitutional history (History 4 and 14).

Minors: Twenty hours, selected from two of the following subjects: history, economics, law, sociology, philosophy, and education.

Courses for Undergraduates

NOTE.—Courses 1 and 3 give a survey of national, state, and local government in the United States, and should be taken by students specializing in political science. Course 1a is open only to students in the colleges of Engineering and Agriculture who desire an introductory course in American Government.

1. American National Government.—Historical development, organization, powers, limitations, and practical working of the national government of the United States. *I*; (3).

Prerequisite: Thirty hours of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	1	3	I, Lecture	10	—	10	—	—	—	228 N. H.	Mathews
			A, Quiz	—	—	—	9	—	—	306 L. H.	Mathews
			B, Quiz	—	—	—	10	—	—	—	Mathews
			C, Quiz	—	—	—	11	—	—	—	Mathews
Students who elect the I lecture must take a quiz scheduled thereunder; those electing II lecture a quiz scheduled thereunder.			D, Quiz	—	—	—	—	10	—	101 Com.	Story
			II, Lecture	2	—	2	—	—	—	111 Com.	Cushman
			E, Quiz	—	—	—	1	—	—	228 N. H.	Garner
			F, Quiz	—	—	—	2	—	—	308 U. H.	Cushman
			G, Quiz	—	—	—	—	2	—	308 U. H.	Cushman
										311 U. H.	Garner
										308 U. H.	Cushman

3. State and Local Government.—Powers, obligations, and rights of the states in the Federal Union; formation and admission of states; development of state constitutions; organization of state and local government; political methods. (A continuation of Political Science 1; may be taken independently.) *II*; (3).

Prerequisite: Thirty hours of university work.

NOTE.—Students may not take both 3 and 16 for more than a total of four hours' credit.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	3	3	I, Lecture	10	—	10	—	—	—	100 Chem.	Mathews
			A, Quiz	—	—	—	9	—	—	306 L. H.	Story
			B, Quiz	—	—	—	10	—	—	308 L. H.	Story
			C, Quiz	—	—	—	—	9	—	218 L. H.	Mathews
			D, Quiz	—	—	—	—	10	—	308 Com.	Mathews
Students who elect the I lecture must take a quiz scheduled thereunder; those electing II lecture a quiz scheduled thereunder			E, Quiz	—	—	—	—	11	—	110 L. H.	Story
			II, Lecture	2	—	2	—	—	—	228 N. H.	Garner
			F, Quiz	—	—	—	1	—	—	308 U. H.	Cushman
			G, Quiz	—	—	—	2	—	—	308 U. H.	Cushman
										311 U. H.	Garner
			H, Quiz	—	—	—	—	2	—	308 U. H.	Cushman

1a. American Government and Politics.—National, state, and local government. (Open only to students in the Colleges of Engineering and Agriculture.) *I*; (2)

Prerequisite: Thirty hours of university work. No credit is allowed for this course if the student takes course 1 or 3.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	1a	2	—	—	10	—	10	—	—	308 L. H.	Cushman

16. Government in Illinois.—The commonwealth and the nation; constitutional development; organs of state government and their work; organization of the local governments and their functions; methods and agencies of popular control in public affairs; contemporaneous problems. *II*; (2).

Prerequisite: Thirty hours of university work.

NOTE.—Students may not take both 3 and 16 for more than a total of four hours' credit.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	16	2	Lecture	—	—	—	8	—	—	202 L. H.	Story
			A, Discussion	—	8	—	—	—	—	202 L. H.	Story
			B, Discussion	—	9	—	—	—	—	317 L. H.	Story

Courses for Advanced Undergraduates and Graduates

NOTE.—Junior standing is required for admission to the following courses:

4. Municipal Government.—The growth of cities; their legal and social status; municipal organization in the United States, including mayor and council, commission, and city manager plans; municipal organization abroad; municipal functions. *I*; (3).

Prerequisite: Senior standing, or junior standing and one of the following; (1) Three hours in either political science or sociology; (2) Five hours in either economics or history; (3) Major work in civil or in municipal and sanitary engineering.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	4	3	Lecture	8	—	—	—	8	—	202 L. H.	Story
			A, Discussion	—	—	8	—	—	—	202 L. H.	Story
			B, Discussion	—	—	9	—	—	—	— L. H.	Story

5. Constitutional Law of the United States.—The judicial interpretation of the constitution. Judicial power to declare laws unconstitutional; separation of governmental powers; relation of state and national governments; national taxation; control of interstate commerce; protection of civil and political rights (due process of law); jurisdiction of the courts. *I*; (3).

Prerequisite: Political Science 1; junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	5	3	—	9	—	9	—	9	—	317 L. H.	Cushman

6. International Law.—The development, nature, source, and present status of the law of nations; the doctrine of intervention; the laws of war and peace; the rights and duties of neutrals; the arbitration movement. Lectures; assigned readings; reports. *I*; (3).

Prerequisite: Graduate or senior standing, or junior standing with six hours of history and five hours of political science.

Political Science

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	6	3	—	3	—	3	—	3	—	317 L. H.	Garner

7. American Diplomacy.—The genesis and present organization of the Department of State; the diplomatic service; the treaty making power; the methods and traditional principles of the foreign policy of the United States; diplomatic controversies with foreign powers; the United States as a world power. *II*; (3).

Prerequisite: Political Science 1 or History 3a-3b; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	7	3	—	2	—	2	—	2	—	306 L. H.	Mathews

9. Principles of Jurisprudence.—The nature and sources of law; development and comparison of the Roman and English legal systems; English law in the United States; classification of law. *II*; (2).

Prerequisite: Political Science 1 or its equivalent; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	9	2	—	—	10	—	10	—	—	306 L. H.	Fairlie

11. Constitutional Aspects of Social and Industrial Problems.—The nature of the police power; legislation concerning public health, order, and safety; constitutionality of labor legislation; control of combinations of capital; regulation of public service companies. *II*; (3).

Prerequisite: Six hours of political science or economics; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	11	3	—	9	—	9	—	9	—	317 L. H.	Cushman

12. National Administration in the United States.—Administrative powers of the President and Congress; principles of administrative organization; the President's cabinet, the executive departments, boards and commissions and administrative services of the national government; judicial administration and the relation of the courts to the executive authorities. *II*; (3).

Prerequisite: Political Science 1; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	12	3	—	11	—	11	—	11	—	317 L. H.	Fairlie

13. State Administration in the United States.—Organization and methods of the executive departments of the state governments: the governor, heads of administrative departments, boards and commissions, and the civil service. Tendencies toward centralization in taxation, education, and the enforcement of state law. *I*; (3).

Prerequisite: Political Science 3 or its equivalent; junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	13	3	—	11	—	11	—	11	—	317 L. H.	Mathews

14. Political Parties and Methods.—Development and organization of political parties and political methods, primarily in the United States; recent legislation on primary elections and corrupt practises; criticism and defense of the party system. *I*; (2).

Prerequisite: One course in political science; junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	14	2	—	—	10	—	10	—	—	306 L. H.	Fairlie

18. Legislation in the United States.—Nature of the legislative power; constitutional limitations; organization, rules of procedure, and practise of American legislative bodies; bill drafting; reference bureaus; criticism of bills and discussion of principles of legislation. *II*; (3).

Prerequisite: Six hours of political science; junior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	18	3	—	8	—	8	—	8	—	317 L. H.	Story

21. British Government.—Political institutions in the United Kingdom and the British dominions; the Crown, the Cabinet, the House of Commons, and the House of Lords; the party system; the courts of law; local government; the crown colonies and the self-governing dominions; recent developments and proposed changes. *I*; (2).

Prerequisite: Graduate or senior standing, or junior standing with six hours of political science.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	21	2	—	—	11	—	11	—	—	317 L. H.	Fairlie

21a. Problems in British Government.—(Supplemental to Political Science 21.) Special reports and conferences. *I*; (1). *Time to be arranged.* Professor FAIRLIE

Prerequisite: Registration in Political Science 21.

22. Continental European Governments.—The political systems of France, Germany, Austria-Hungary, Italy, and Switzerland; constitutional beginnings; political organizations; methods of legislation and administration; constitutional guaranties for the protection of individual rights. *II*; (3).

Prerequisite: Open to graduate students and seniors, who have had six hours in political science. History 20a-20b and Political Science 21 recommended.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	22	3	—	3	—	3	—	3	—	317 L. H.	Garner

28. Problems of Contemporaneous Politics.—A study of some of the larger questions of present day politics; such as the reorganization of state government; state socialism; foreign and colonial policies; parliamentary government; direct popular government. *I*; (2).

Prerequisite: Senior standing, or junior standing and one course in political science.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Political Science	28	2	—	—	8	—	8	—	—	317 L. H.	Story

34. Municipal Problems.—Municipal administration in the United States and Europe; principles of administrative organization; city planning and housing; public utilities; police and sanitary administration; municipal finances: Lectures; readings; special reports. *II*; (3).

Prerequisite: Open to graduate students, and to undergraduate students who have had Political Science 4, or Economics 1, or who have senior standing in the curriculum in municipal or highway engineering.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Political Science	34	3	—	10	—	10	—	10	—	317 L. H.
										Instructor Fairlie

35. Legal Problems of the City.—Legal status of the city; powers of the city in the matter of police regulations, taxation, special assessments, streets, public utilities, and city planning; municipal contracts and liabilities. Given 1917-18, and alternate years thereafter. *II*; (2).

Prerequisite: Senior standing, or junior standing and one course in political science or major work in municipal and sanitary engineering.

SECOND SEMESTER										
Subject	No.	Credits	Section	M	T	W	T	F	S	Room
Political Science	35	2	—	—	8	—	8	—	—	317 L. H.
										Instructor Cushman

36a-36b. Thesis Course.—Research work for candidates for honors and other seniors. *I, II*; (2). *Time to be arranged.*

Courses for Graduates

101. History of Political Theories.—Ancient, medieval, and modern political thought; political theories of Aristotle, Plato, Machiavelli, Hobbes, Locke, Montesquieu, and others. American political philosophy. *Twice a week; I*; (1 unit). *Time to be arranged.* Professor GARNER

[102. The Nature of the State.—Principles, methods, and nature of political science; the origin, attributes, forms, and functions of the state; sovereignty and liberty; citizenship and nationality; constitutions, their nature and forms; principles of legislative, executive, and judicial organization. Alternating with course 101. *Twice a week; I*; (1 unit). (Not given, 1917-18.) Professor GARNER]

103. Seminar in Political Science and Public Law.—Special problems; reports; discussions and criticism. The research work of candidates who are writing theses is under the direction of some instructor to whom they report frequently. *Once a week; I, II. Time to be arranged.* Members of the department

106. International Law as Applied During the European War.—Causes of the war; treatment of alien enemies; contraband; blockades; transfers of flag; reprisals; military government of occupied territory; contributions and requisitions; rights and duties of neutrals. *Twice a week; II*; (1 unit). *Time to be arranged.* Professor GARNER

112. Studies in Public Administration.—Special topics in comparative national or local administration. *Twice a week; I*; (1 unit). Professor FAIRLIE

113. State Government and Administration.—Studies in the organization and methods of state governments in formulating and executing public policies; investigation of problems. Different topics in succeeding years. *Twice a week; II*; (1 unit). Assistant Professor MATHEWS

PSYCHOLOGY

MADISON BENTLEY, Ph.D., *Professor*CHRISTIAN ALBAN RUCKMICH, Ph.D., *Assistant Professor*CARL RAHN, Ph.D., *Instructor*GEROLD CARL WICHMANN, A.B., *Assistant*COLEMAN R GRIFFITH, A.B., *Assistant*

Major: Twenty hours chosen from courses announced by the department, except that six hours may be chosen from one or more of the following subjects: Philosophy 1, 2, 3, 4; Physics 1a-1b, 3a-3b, 7a-7b; Zoology 2, 5, 9, 15; and Animal Husbandry 30.

Minors: Twenty hours chosen from education, genetics, philosophy, physics, physiology, sociology, and zoology.

1. Introduction to Psychology.—The facts and laws of mind. Sensation and image, attention, memory, emotion, action, and thought. Experimental methods and their results are illustrated in lecture by demonstrations. This course is preliminary to all other work of the department. Lectures; sectional meetings. *I*; (3).

Prerequisite: One year of university work.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	1	3	Lecture	9	—	9	—	—	—	Morrow Hall	Bentley
			A	—	—	—	—	9	—	419 U. H.	Ruckmich Rahn Wichmann Griffith
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	410 U. H.	
			D	—	—	—	—	10	—	417 U. H.	
			E	—	—	—	—	—	9	410 U. H.	
			F	—	—	—	—	—	9	418 U. H.	
			G	—	—	—	2	—	—	419 U. H.	
			H	—	—	—	—	2	—	— U. H.	

2. General Psychology.—Mental inheritance, habit, custom, and fashion; the relations of psychology to the biological and social sciences; comparative and genetic psychology, and the psychology of the abnormal; applications of psychology to the arts and professions. *II*; (3).

Prerequisite: Psychology 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	2	3	Lecture	9	—	9	—	—	—	410 U. H.	Ruckmich
			A	—	—	—	—	9	—	417 U. H.	Ruckmich Wichmann Griffith
			B	—	—	—	—	9	—	420 U. H.	
			C	—	—	—	—	9	—	410 U. H.	
			D	—	—	—	—	10	—	417 U. H.	
			E	—	—	—	—	2	—	507 U. H.	

3. Laboratory Practise (Elementary). Classical experiments in the fields of sensation, feeling, attention, and action. A drill course in scientific method. *I* or *II*; (2).

Prerequisite: Psychology 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	3	2	A	2,3	—	2,3	—	—	—	507 U. H.	Rahn
			B	—	10,11	—	10,11	—	—	507 U. H.	Ruckmich
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			A	2,3	—	2,3	—	—	—	507 U. H.	Ruckmich
			B	—	10,11	—	10,11	—	—	507 U. H.	Wichmann

Psychology

5. Comparative Psychology.—Mind in animal forms; the psychological implications of organic evolution; a comparison of human and animal minds; criticism of current literature. (Recommended to students who intend to elect advanced courses either in animal psychology or in the study of behavior.) Lectures; laboratory. *I*; (2).

Prerequisite: Psychology 1.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	5	2	—	—	2,3	—	2,3	—	—	510 U. H.	Bentley Rahn

6. Comparative Psychology (Advanced Laboratory). Individual studies in animal psychology. *II*; (2-4).¹

Prerequisite: Psychology 1 and 5.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	6	2 to 4 ¹	—				(Arrange)			510 U. H.	Bentley Rahn

9. Physiological Psychology.—Correlations between the structure and functions of the nervous system and the phenomena of human consciousness; a formulation of the problem of psychophysical relationship. Lectures; readings; discussions. *II*; (3).

Prerequisite: Psychology 1 and 2, or 1 and 3, and laboratory training in one of the biological sciences.

SECOND SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	9	3	—	10	—	10	—	10	—	507 U. H.	Rahn

10. German Reading.—Translation into English of a German psychological text. *I*; (1).

Prerequisite: Psychology 1 and a fair reading knowledge of German.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	10	1	—	—	11	—	—	—	—	105 L. H.	Bentley

12-13. Minor Problems (Advanced Laboratory).—The application of methods suitable to new problems. *I, II*; (2-5).¹

Prerequisite: Psychology 1, 2, 3.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Psychology	12	2 to 5 ¹	—				(Arrange)			507 U. H.	Bentley Ruckmich Rahn
SECOND SEMESTER											
Psychology	13	2 to 5 ¹	—				(Arrange)			507 U. H.	Bentley Ruckmich Rahn

14. Social Psychology.—The social consciousness and the collective mind; analysis of the conditions upon which the social consciousness depends; perceptual, ideational, and emotional factors in the social consciousness; the genetic development of the collective mind as revealed in tradition and institutions. *I*; (3).

Prerequisite: Psychology 1 and one other course.

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	14	3	—	11	—	11	—	11	—	105 L. H.	Rahn

16. Genetic Psychology.—The appearance of instinctive responses, the formation of habits, and the development of mental functions in the child from birth to maturity. Lectures; collateral reading; discussions. *I*; (2).

Prerequisite: Psychology 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	16	2	—	—	2	—	2	—	—	507 U. H.	Ruckmich

17. The History of Psychology.—The rise and development of the science of psychology. Lectures and readings in the sources. *II*; (2).

Prerequisite: Psychology 1, 2, and one other course.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	17	2	—	11	—	11	—	—	—	105 L. H.	Ruckmich

20. Systematic Psychology.—The nature of psychological analysis; the principles underlying psychological construction. Lectures and essays. (For graduates and advanced undergraduates.) *II*; (3).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	20	3	—	9	—	9	—	9	—	507 U. H.	Bentley

21-22. Special Studies.—Individual investigations, for advanced students, in the form of essay or of experiment. *I, II*; (3).

Prerequisite: Psychology 1, and one other course.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Psychology	21	3	—	(Arrange)						507 U. H.	Bentley Ruckmich Rahn

Subject	No.	Credits	Section	SECOND SEMESTER					
				Schedule the same as for 21 (first semester).					
Psychology	22	3	—						

Courses for Graduates

103. Research.—Experimental and historical investigations. *I, II*; ($\frac{1}{2}$ to 2 units). *Time to be arranged.* Professor BENTLEY, Dr. RUCKMICH, Dr. RAHN

105. Seminar.—Discussion of current topics in their historical setting. *Once a week; I, II; ($\frac{1}{2}$ unit). Time to be arranged.* Professor BENTLEY

PUBLIC SPEAKING

(See under THE ENGLISH LANGUAGE AND LITERATURE)

RAILWAY ADMINISTRATION

(See TRANSPORTATION)

RAILWAY ENGINEERING

EDWARD CHARLES SCHMIDT, M.E., *Professor*

JOHN McBEATH SNODGRASS, B.S., *Assistant Professor, Railway Mechanical Engineering*

ALONZO MORRIS BUCK, M.E., *Assistant Professor, Railway Electrical Engineering*

Railway Engineering

_____, *Associate, Railway Civil Engineering*
 OTTO STERNOFF BEYER, JR., M.E., *Research Assistant, Engineering Experiment Station*

HAROLD HOUGHTON DUNN, B.S., *Research Assistant, Engineering Experiment Station*

Railway Civil Engineering—Courses 31-51.

Railway Electrical Engineering—Courses 60-68.

Railway Mechanical Engineering—Courses 1-10.

Common to all groups—Courses 25, 98 and 99.

2. Locomotive Design.—Calculations and designs of engine and boiler details; current standards and proportions. Drafting room systems. *I; (3).*

Prerequisite: Mechanical Engineering 12, 62; Railway Engineering 6.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	2	3	W	1-4	—	1-4	—	1-4	—	103 T. B.	Snodgrass

5. Railway Laboratory.—Locomotive testing; experimental work with electric and steam railway test cars, brakeshoe testing machine, drop testing machine and air-brake apparatus. *I; (3).*

Prerequisite: Railway Engineering 6; Mechanical Engineering 12, 62.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	5	3	W	—	8-11	—	11	—	8-11	105 T. B.	Beyer

6. Locomotives.—Mechanics; performance; design. *II; (4).*

Prerequisite: Theoretical and Applied Mechanics 21, 29; registration in Mechanical Engineering 12 and 62.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	6	4	W	9	—	9	—	9	9	215 T. B.	Schmidt

7. Advanced Design.—Problems in locomotive and car design. *II; (3).*

Prerequisite: Railway Engineering 2. ←

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	7	3	W	—	8-11	2,3	8-11	—	—	103 T. B.	Snodgrass

8. Railway Laboratory.—Investigation of train resistance and locomotive tractive effort by the use of the railway test car. Analysis of the results and their application to the problems of tonnage rating. *II; (2).*

Prerequisite: Railway Engineering 5.

SECOND SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	8	2	W	—	—	—	11	—	8-11	105 T. B.	Dunn

9. Seminar.—Discussion of current topics and review of railway journals; assigned topics and reports. *I; (1).*

Prerequisite: Open to seniors in railway courses only.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Ry. E.	9	1	W	—	11	—	—	—	—	105 T. B.	Schmidt

25. Railway Development.—History and organization of steam and electric railways; statistics; costs. *I; (3).*

Prerequisite: Open to juniors in railway courses only.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	25	3	—	—	10	—	10	—	10	105 T. B.	Schmidt Snodgrass Buck

31. Railway Yards and Terminals.—Theory of design; arrangement of grades in gravity yards; problems. *II*; (3).

Prerequisite: Civil Engineering 51.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	31	3	U	1-4	—	—	8	1-4	—	103, 203 T. B.	Beyer

32. Railway Construction.—Advanced course in design of railway structures; study of cost analysis; preparation of estimates of cost, complete working drawings, and contracts and specifications for assigned problems in design. *I*; (3). (Not given, 1917-18.)

Prerequisite: Civil Engineering 51.]

33. Economic Theory of Railway Location.—Influence of volume of traffic, alignment, and gradient upon operating expenses; locomotive and grade problems; relocation of existing lines. *II*; (4). (Not given, 1917-18.)

Prerequisite: Civil Engineering 51; Theoretical and Applied Mechanics 20, 21.]

34. Railway Maintenance.—Systems; track design; standards and charts; classification of accounts; measuring efficiency; emergency organization. *II*; (4). (Not given, 1917-18.)

Prerequisite: Civil Engineering 51.]

35. Railway Signaling.—Block and route signaling; systems in current use; history of development; study of railway accidents. *I*; (1). (Not given, 1917-18.)

Prerequisite: Civil Engineering 51.]

50-51. Seminar.—Current topics; review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	50	1	U	—	—	—	—	9	—	203 T. B.	Snodgrass

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	51	1	U	—	—	—	11	—	—	203 T. B.	Snodgrass

60. Electric Railway Principles.—Mechanics of traction; train resistance; braking of electric railway trains; method of solving fundamental electric railway problems. *II*; (2).

Prerequisite: Theoretical and Applied Mechanics 25; Electrical Engineering 25, 75.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	60	2	V	—	8	—	8	—	—	105 T. B.	Buck

61. Electric Traction.—Selection and operation of equipment. A condensed course for students in railway mechanical engineering or other engineering departments. *II*; (3).

Prerequisite: Theoretical and Applied Mechanics 21 or 25; Electrical Engineering 11, 61, or 25, 75.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	61	3	V	8	—	8	—	8	—	105 T. B.	Buck

Railway Engineering

62. Electric Railway Laboratory.—Tests of electrical machinery used in railway service. *I*; (2).

Prerequisite: Railway Engineering 60.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	62	2	V	—	—	—	8	—	—	105 T. B. E. L.	} Buck
				—	8-11	—	—	—	—		

63. Electric Railway Laboratory.—(A continuation of Railway Engineering 62.) Tests with the electric test car and the steam dynamometer car to determine train resistance and power consumption. *II*; (2).

Prerequisite: Railway Engineering 62, 64.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	63	2	V	—	—	—	10	—	—	105 T. B. E. L.	} Buck
				—	9-12	—	—	—	—		

64. Electric Railway Practise.—Types of equipment; energy consumption; methods of distribution. *I*; (3).

Prerequisite: Theoretical and Applied Mechanics 25; Electrical Engineering 26, 76; Railway Engineering 60.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	64	3	V	9	—	9	—	9	—	105 T. B.	Buck

65. Electric Railway Economics.—Location and operation; choice of systems; location of power plant and sub-stations; calculation of transmission and distribution of circuits; maintenance of way and of equipment; electrification of steam roads. *II*; (4).

Prerequisite: Railway Engineering 64.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	65	4	V	9	—	9	9	9	—	105 T. B.	Buck

66. Electric Railway Machinery.—Theory and characteristics of electrical machinery used for railway service, of transmission and distribution lines. *I*; (3).

Prerequisite: Railway Engineering 60; Electrical Engineering 26, 76.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	66	3	V	11	—	11	—	11	—	105 T. B.	Buck

67-68. Seminar.—Current topics; review of railway journals; assigned topics and reports. *I, II*; (1).

Prerequisite: Open to seniors in railway courses only.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Ry. E.	67	1	V	—	—	—	9	—	—	105 T. B.	Buck

SECOND SEMESTER									
Ry. E.	68	1	V	(Arrange)				105 T. B.	Buck

98. Thesis.—Independent solution of some railway problem or the investigation of some subject. The thesis may consist of an original design or of an original experimental investigation, or may be the analysis and discussion of facts already in existence. *II*; (3). *Time to be arranged.*

Professor SCHMIDT, Assistant Professor SNODGRASS, Assistant Professor BUCK

99. Inspection Trip.—*I*; (no credit).

Prerequisite: Senior standing.

Courses for Graduates

Entrance on graduate work in railway engineering presupposes the full undergraduate course in that subject.

102. Locomotive Design.—Modern practise concerning steam pressure, compounding, superheating. *Once a week; I, II; (1 unit). Time to be arranged.*

Assistant Professor SNODGRASS

106. Locomotive Operation.—Train resistance and tractive effort; tonnage ratings. *Once a week; I, II; (1 unit). Time to be arranged.*

Professor SCHMIDT

108. Electric Railway Practise.—The design, selection, operation, and maintenance of equipment; central station, substation, rolling stock, and line equipment. *Once a week; I, II; (1 unit). Time to be arranged.*

Assistant Professor BUCK

[110. Railway Location.—The effect of location upon earning capacity; problems in original location, in the relocation and reduction of grades of existing lines. *I, II; (1 unit). (Not given, 1917-18.)]*

RHETORIC

(See ENGLISH)

ROMANCE LANGUAGES AND LITERATURE

KENNETH MCKENZIE, Ph.D., *Professor*

THOMAS EDWARD OLIVER, Ph.D., *Professor*

JOHN DRISCOLL FITZ-GERALD, II., Ph.D., *Professor of Spanish*

DAVID HOBART CARNAHAN, Ph.D., *Professor*

ARTHUR ROMEYN SEYMOUR, Ph.D., *Associate*

OLIN HARRIS MOORE, Ph.D., *Associate*

JOSEPH EUGENE GILLET, Ph.D., *Associate in Romance Languages and Comparative Literature*

JOHN VAN HORNE, Ph.D., *Instructor*

CHARLES SERAPHIN CARRY, *Assistant*

RAFAEL ARCANGEL SOTO, B.S., A.M., *Assistant*

HERBERT KING STONE, A.B., *Assistant*

JOHN RAYMOND SHULTERS, A.M., *Assistant*

MANUEL LÓPEZ, A.B., *Assistant*

PARK POWELL, A.B., B.S., *Assistant*

PEDRO BACH Y RITA, *Assistant*

JANE COULSON WATSON, A.M., *Assistant*

ELIZA CURTIS, *Assistant*

FRENCH

Major: 20 hours of French, exclusive of French 1a, 1b, 2a, 6a, 6b.

Minors: 20 hours in not more than three of the following subjects: English (excluding Rhetoric 1-2) German, Greek, Italian, Latin, Spanish, comparative literature, history, and philosophy, provided that 8 hours must be taken in one subject other than a Romance language.

ROMANCE LANGUAGES

Major: 20 hours in French and one other Romance Language, exclusive of French 1a, 1b, 2a, 6a-6b, Italian 1a-1b, Spanish 1a-1b.

Minors: 20 hours in not more than three of the following subjects: English (excluding Rhetoric 1-2), German, Greek, Italian, Latin, Spanish, comparative literature, history, and philosophy, provided that the minor does not include any language contained in the major in Romance Languages.

A. FRENCH

Courses for Undergraduates

1a. Elementary Course.—Grammar; pronunciation; reading of modern authors; composition; conversation. *I or II; (4).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	1a	4	A	—	8	8	8	8	—	109 U. H.	Shulters
			B	—	8	8	8	8	—	401 U. H.	Powell
			C	—	9	9	9	9	—	208 U. H.	—
			D	—	10	10	10	10	—	208 U. H.	Gillet
			E	—	10	10	10	10	—	109 U. H.	Carry
			F	—	11	11	11	11	—	208 U. H.	Oliver
			G	1	1	1	1	—	—	208 U. H.	Stone
			H	2	2	2	2	—	—	208 U. H.	Carry
			(Primarily for students in Engineering.)								
			R	—	9	9	9	9	—	109 U. H.	Powell
			S	—	11	11	11	11	—	109 U. H.	Stone

SECOND SEMESTER

—	8	8	8	8	—	111 U. H.	Powell
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1b. Elementary Course.—(Continuation of French 1a.) *I or II; (4).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	1b	4	—	—	9	9	9	9	—	207 U. H.	Stone

SECOND SEMESTER

Sections and schedule the same as for 1a (first semester).

2a-2b. Modern Prose, Poetry, and Drama.—Rapid reading of modern authors; advanced syntax and composition. *I, II; (4).*

Prerequisite: French 1a-1b, or an equivalent demonstrated by examination.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	2a	4	A	—	8	8	8	8	—	207 U. H.	Moore McKenzie Stone Carnahan
			B	—	10	10	10	10	—	207 U. H.	
			C	2	2	2	2	—	—	207 U. H.	

SECOND SEMESTER

French 2b 4 Sections and schedule the same as for 2a (first semester).

5a-5b. Introduction to French Literature.—Authors of the last three centuries. Composition; review of the grammar. *I, II; (3).*

Prerequisite: French 2a-2b, or an equivalent demonstrated by examination.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	5a	3	—	10	—	10	—	10	—	211 L. H.	Fitz-Gerald

SECOND SEMESTER

French 5b 3 — Schedule the same as for 5a (first semester).

6a-6b. Second-Year Conversation.—Mainly classroom work. (Does not count toward a major in French.) *I, II; (1).*

Prerequisite: French 1a-1b, with a grade of at least 85.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	6a	1	A	—	8	—	8	—	—	211 L. H.	Carry
			B	—	9	—	9	—	—	211 L. H.	Carry

SECOND SEMESTER

French 6b 1 Sections and schedule the same as for 6a (first semester).

7a-7b. Intermediate Composition and Conversation.—Conducted entirely in French, giving facility in idiomatic expression in writing and speaking. Reading; themes; talks on France and French life. *I, II; (2).*

Prerequisite: French 2a-2b, or 6a-6b.

NOTE.—Required of those who are given the recommendation of the department to teach French.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	7a	2	A	8	—	8	—	—	—	211 L. H.	Carry
			B	—	11	—	11	—	—	211 L. H.	Gillet

SECOND SEMESTER

French 7b 2 Sections and schedule the same as for 7a (first semester).

8a-8b. Advanced Composition and Conversation.—French life and literature. Idiomatic construction; syntax; themes. Conducted entirely in French. *I, II; (2).*

Prerequisite: French 7a-7b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	8a	2	—	11	—	—	—	11	—	211 L. H.	Gillet

SECOND SEMESTER

French 8b 2 — Schedule the same as for 8a (first semester).

25. Course for Teachers.—Methods of teaching French in this country and abroad; actual contact with class-room problems. *I; (2).*

Prerequisite: Twenty-four hours' credit in French, including French 7a-7b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	25	2	—	—	9	—	9	—	—	216 L. H.	Carnahan

28a-28b. Senior Thesis.—For candidates for honors in French; open to other seniors. *I, II; (1).* Time to be arranged.

Courses for Advanced Undergraduates and Graduates

Prerequisite for the courses following: at least three years of college French or the equivalent.

10a-10b. Survey of French Literature.—Special periods and authors. The main currents of French literature from the beginning to the present time. *I, II; (3).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	10a	3	—	9	—	9	—	9	—	211 L. H.	Carnahan

SECOND SEMESTER

French 10b 3 — Schedule the same as for 10a (first semester).

24a-24b. Seventeenth and Eighteenth Century Drama.—Corneille, Racine, Moliere, Voltaire, Marivaux, Sedaine, Beaumarchais. Lectures and interpretation. *I, II; (2).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	24a	3	—	10	—	10	—	10	—	117 L. H.	Oliver

SECOND SEMESTER

French 24b 3 — Schedule the same as for 24a (first semester).

45a-45b. French Realism.—Flaubert, Maupassant, E. and J. de Goncourt, Daudet, Zola. Lectures; reports on collateral reading. Conducted in French if desired. *I, II; (2).*

Romance Languages and Literature

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
French	45a	2	—	—	10	—	10	—	—	117 L. H.	Moore
SECOND SEMESTER											
French	45b	2	—	Schedule the same as for 45a (first semester).							

Courses for Graduates

Before entering on the study of Romance Languages as a major for an advanced degree, a candidate must have had at least (a) three years of college work in French, together with a reading knowledge of Italian or Spanish; or (b) two years of college work in French and the same in Italian or Spanish. The candidate must also have had satisfactory training in Latin, and be able to read German prose.

Graduate students who select Romance languages as a first or second minor must have had at least two years of college work in the language desired and be able to read German prose.

102. Old French Lyric and Prose Literature.—Critical interpretation of didactic, historical, and lyric writings; history of these types of medieval literature. *Twice a week; I, II; (1 unit).* Time to be arranged. Professor OLIVER

103. Seventeenth Century Prose Writers.—French society, culture, and prose literature of the seventeenth century; the great writers; the formation of classic ideals. *Once a week; I, II; (½ unit).* Time to be arranged. Professor OLIVER

119. Belgian Literature in French since 1880.—Reading and reports. *Twice a week; II; (1 unit).* Time to be arranged. Dr. GILLET

127. French Romanticism.—Origin and development of the Romantic movement in France. *Twice a week; I, II; (1 unit).* Time to be arranged. Professor CARNAHAN

B. ITALIAN

Course for Undergraduates

1a-1b. Elementary Course.—Grammar; composition; conversation; reading. *I, II; (3).*

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Italian	1a	3	—	11	—	11	—	11	—	117 L. H.	McKenzie
SECOND SEMESTER											
Italian	1b	3	—	Schedule the same as for 1a (first semester).							

Course for Advanced Undergraduates and Graduates

2a-2b. Italian Literature.—Italian writers of the nineteenth century. Composition; conversation. Introduction to the study of Dante. *I, II; (2).* Time to be arranged. Dr. VAN HORNE

Prerequisite: A reading knowledge of Italian.

Course for Graduates

140. Dante.—The *Vita Nuova* and portions of the *Divina Commedia*. *Twice a week; I; (1 unit).* Time to be arranged. Professor MCKENZIE

C. SPANISH

Courses for Undergraduates

1a. Elementary Course.—Grammar; pronunciation; reading; composition; conversation. *I or II; (4).*

Romance Languages and Literature

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Spanish	1a	4	A	—	8	8	8	8	—	208 U. H.	Soto
			B	—	8	8	8	8	—	206 U. H.	López
			C	—	9	9	9	9	—	206 U. H.	Seymour
			D	—	9	9	9	9	—	111 U. H.	Watson
			E	—	10	10	10	10	—	401 U. H.	Bach y Rita
			F	—	10	10	10	10	—	206 U. H.	Watson
			G	—	11	11	11	11	—	206 U. H.	Van Horne
			H	—	11	11	11	11	—	207 U. H.	Moore
			J	1	1	1	1	—	—	207 U. H.	López
			K	1	1	1	1	—	—	206 U. H.	Curtis
			L	2	2	2	2	—	—	206 U. H.	Watson
			(Primarily for students in Engineering)								
			R	—	9	9	9	9	—	214 U. H.	Soto
			S	—	11	11	11	11	—	512 U. H.	Powell
			T	2	2	2	2	—	—	111 U. H.	Bach y Rita
			Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
			A	—	11	11	11	11	—	111 U. H.	López
			B	1	1	1	1	—	—	109 U. H.	Bach y Rita

1b. Elementary Course.—(Continuation of 1a.) *I* or *II*; (4).

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Spanish	1b	4	A	—	11	11	11	11	—	111 U. H.	López
			B	1	1	1	1	—	—	109 U. H.	Bach y Rita

SECOND SEMESTER

Sections and schedule the same as for 1a (first semester).

2a-2b. Modern Spanish.—Rapid reading of modern authors; review of grammar; conversation on topics of everyday life; composition. *I, II*; (4).

Prerequisite: Spanish 1a-1b, or an equivalent demonstrated by examination.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Spanish	2a	4	A	—	10	10	10	10	—	308 U. H.	Fitz-Gerald Soto Soto
			B	2	2	2	2	—	—	302 U. H.	

SECOND SEMESTER

Spanish 2b 4 Sections and schedule the same as for 2a (first semester).

3a-3b. Introduction to Spanish Literature.—Rapid reading of modern authors, and of the more important writers of the seventeenth century. *I, II*; (3).

Prerequisite: Spanish 2a-2b, or an equivalent demonstrated by examination.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Spanish	3a	3	—	9	—	9	—	9	—	117 L. H.	Van Horne
			—	—	—	—	—	—	—	—	

SECOND SEMESTER

Spanish 3b 3 — Schedule the same as for 3a (first semester).

4a-4b. Business Correspondence and Conversation.—Reading of facsimile business correspondence; writing of business letters; conversation. Reports in Spanish on commercial topics. Conducted in Spanish. *I, II*; (2).

Prerequisite: Spanish 2a-2b.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Spanish	4a	2	—	—	8	—	8	—	—	113 L. H.	Bach y Rita
			—	—	—	—	—	—	—	—	

SECOND SEMESTER

Spanish 4b 2 — Schedule the same as for 4a (first semester).

Romance Languages and Literature

5a-5b. Business Practise in Spanish.—Study and drafting of commercial, legal, consular and governmental documents and of trade reports. Conversation. Advanced correspondence. (Primarily for students in the College of Commerce and Business Administration.) *I, II; (2). Time to be arranged.* Dr. SEYMOUR

Prerequisite: Spanish 4a-4b.

Courses for Advanced Undergraduates and Graduates

11a-11b. The Spanish Drama of the Sixteenth and Seventeenth Centuries.—Earlier dramatists; representative plays of Lope de Vega, Calderón, Ruiz de Alarcón and Tirso de Molina. Reports on outside reading. *I, II; (2).*

Prerequisite: Spanish 3a-3b, or the permission of the instructor.

FIRST SEMESTER											
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Spanish	11a	2	—	—	10	—	10	—	—	113 L. H.	Seymour

SCANDINAVIAN LANGUAGES AND LITERATURE

(See GERMANIC LANGUAGES AND LITERATURE)

THE SOCIAL SCIENCES

(See ECONOMICS, HISTORY, POLITICAL SCIENCE, and SOCIOLOGY)

SOCIOLOGY

EDWARD CARY HAYES, Ph.D., *Professor*JAMES GARFIELD STEVENS, Ph.D., *Associate*HERBERT KNIGHT DENNIS, A.M. *Assistant**Cooperating:*DAVID KINLEY, Ph.D., LL.D., *Professor of Economics*HENRY ELMER HOAGLAND, Ph.D., *Instructor in Economics***Major:** 20 hours from any courses offered in the department.**Minors:** 20 hours chosen from two or three of the following subjects: History, economics, political science, philosophy, and psychology.

Courses for Undergraduates

1. The Principles of Sociology and Their Application to Present Problems.—

*I or II; (3).**Prerequisite:* Junior standing.

FIRST SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Sociology	1	3	A	8	—	8	—	8	—	306 L. H.	Dennis
			B	9	—	9	—	9	—	306 L. H.	Hayes
			C	—	8	—	8	—	8	306 L. H.	Dennis
			D	11	—	11	—	11	—	306 L. H.	Hayes
			E	9	—	9	—	9	—	320 L. H.	Dennis
			F	11	—	11	—	11	—	320 L. H.	Dennis
			G	11	—	11	—	11	—	308 L. H.	Stevens
SECOND SEMESTER											
			H	8	—	8	—	8	—	306 L. H.	Dennis
			I	11	—	11	—	11	—	308 L. H.	Dennis
			J	9	—	9	—	9	—	306 L. H.	Hayes

[15. **The Family.**—Historical aspects of the family; its role in modern society, and problems of social policy arising therefrom. *II; (3).* (Not given, 1917-18.)*Prerequisite:* Sociology 1.]2. **Social Psychology and Social Control.**—A survey of current tendencies in the psychological interpretation of social life, with special reference to the ways in which the sentiments, opinions and conduct of the members of society are shaped. *II; (3).**Prerequisite:* Sociology 1.

SECOND SEMESTER											
<i>Subject</i>	<i>No.</i>	<i>Credits</i>	<i>Section</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	<i>Room</i>	<i>Instructor</i>
Sociology	2	3	—	—	8	—	8	—	8	—	Dennis

7. The Social Problems of the Rural Community.—*II; (2).**Prerequisite:* Junior standing.

Sociology

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Sociology	7	2	Lecture	—	11	—	—	—	—	202 L. H.	Hayes
			A,Quiz	—	—	—	11	—	—	306 L. H.	Dennis
			B,Quiz	—	2	—	—	—	—	306 L. H.	Dennis
			C,Quiz	—	3	—	—	—	—	306 L. H.	Dennis
			D,Quiz	—	—	—	2	—	—	306 L. H.	Dennis

Courses for Advanced Undergraduates and Graduates

3. Social Evolution.—Modes of social activity among savage, barbarous, and civilized people; family organization, practical arts, economic wants and institutions, origins of government and law, codes of morality, religions; inductions from such facts, as to the theory of social evolution and the method of progress. *II*; (3).

Prerequisite: Sociology 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Sociology	3	3	—	11	—	11	—	11	—	306 L. H.	Hayes

8. Charities.—Evolution of modern organized philanthropy, public and private; causes and prevention of poverty; organization and management of charitable institutions. *I*; (3).

Prerequisite: Sociology 1 or Economics 1; junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Sociology	8	3	A	8	—	8	—	8	—	308 L. H.	Stevens
			B	—	8	—	8	—	8	308 L. H.	Stevens

9. Criminology.—Nature, causes, and treatment of the criminal; evolution of modern methods of criminal procedure and penology; recent experiments and tendencies. *II*; (3).

Prerequisite: Sociology 1 or senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Sociology	9	3	A	8	—	8	—	8	—	308 L. H.	Stevens
			B	9	—	9	—	9	—	308 L. H.	Stevens
			C	—	8	—	8	—	8	308 L. H.	Stevens

10. Population.—Theories and policies of population; Malthus' Principle and its critics; problems in the population of the United States; immigration, race-mixture, conditions affecting public health, death-rate, birth rate, "race-suicide," marriage, divorce; selective influences at work on the "population type." *I*; (3).

Prerequisite: Sociology 1 or Economics 1; senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Sociology	10	3	—	10	—	10	—	10	—	306 L. H.	Stevens

12a-12b. Labor Problems.—The same as Economics 12a-12b. *I, II*; (3).

Prerequisite: Senior standing, Economics 1, and three additional hours in economics for which Economics 1 is a prerequisite; or senior standing and Economics 1, for students whose major is in one of the social sciences.

Subject	No.	Credits	Section	FIRST SEMESTER					Room	Instructor	
				M	T	W	T	F			S
Sociology	12a	3	—	2	—	2	—	2	—	206 Com.	Hoagland

				SECOND SEMESTER
Sociology	12b	3	—	Schedule the same as for 12a (first semester).

14. Social Statistics.—Social investigation and research. Social and community surveys. The verification of sociological laws and principles by the statistical method. Vital statistics and population in the light of data afforded by official publications and special investigations. The statistical method applied to sociology and social problems. *II*; (3).

Prerequisite: Sociology 1 or Economics 1, and, except in special cases, Sociology 10; senior standing.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Sociology	14	3	—	10	—	10	—	10	—	306 L. H.	Stevens

21. Socialism and Economic Reform.—The same as Economics 21. *II*; (2).

Prerequisite: Economics 1 and 3. Students who have taken 6 hours in history and are making sociology their major subject may substitute Sociology 1 for Economics 3 as a prerequisite.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Sociology	21	2	—	—	8	—	8	—	—	206 Com.	Kinley

Courses for Graduates

Preparation for graduate work in sociology must include the equivalent of twelve semester hours in the social sciences, of which at least three must be in sociology, and three in the principles of economics. The remainder may be in any combination of these two subjects, or of history and political science.

100. Bases of Social Theory.—Systematic presentation and critical discussions of the main teachings of sociology. *Twice a week; I; (1 unit). Time to be arranged.* Professor HAYES

102. The Development of Sociology.—Reading of sociological works; discussions; lectures. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor HAYES

150. Seminar.—Detection and statement of problems. Preparation of theses. *Once a week; I, II; (1 or 2 units). Time to be arranged.* Professor HAYES

SPANISH

(See ROMANCE LANGUAGES AND LITERATURE)

TRANSPORTATION

ERNEST RITSON DEWSNUP, A.M., *Professor*

—Assistant

Courses for Undergraduates

1. Transportation System of the United States. *I; (3).*

Prerequisite: Economics 1 or 2; junior standing.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Transportation	1	3	Lecture	—	—	10	—	—	—	100 Com.	Dewsnup
			A, Quiz	10	—	—	—	10	—	210 Com.	Dewsaup
			B, Quiz	—	8	—	8	—	—	210 Com.	—
			C, Quiz	—	1	—	1	—	—	210 Com.	—
			D, Quiz	—	3	—	3	—	—	210 Com.	—

Transportation

7. Railway Organization.—The departments and functions of the American railway. *I*; (2).

Prerequisite: Accountancy 1 and Economics 1, previously or concurrently. For senior students in the College of Engineering, Economics 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Transportation 7	2		—	—	10	—	10	—	—	210 Com.	Dewsnup

35a-35b. Thesis.—Investigation of problems in railway administration. A preliminary outline must be filed with the department by the second Friday in October, an extended outline and bibliography by the second Friday in November, and a first draft of at least fifteen pages of the thesis must be submitted by the second Friday in January. *I, II*; (2). *Time to be arranged.*

Prerequisite: Full senior standing in railway administration.

Courses for Advanced Undergraduates and Graduates

2. Transportation Policy in Europe and in the United States.—The regulation of railways in the United States and Europe. *II*; (3).

Prerequisite: Transportation 1; Economics 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Transportation 2	3		—	10	—	10	—	10	—	210 Com.	Dewsnup

12. Freight Shipment.—Preparation of goods for shipment and practical rate-making. *II*; (2).

Prerequisite: Transportation 7, or 60 hours of university work.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Transportation 12	2		A	—	10	—	10	—	—	210 Com.	Dewsnup
			B	—	8	—	8	—	—	210 Com.	—
			C	—	1	—	1	—	—	210 Com.	—
			D	—	3	—	3	—	—	210 Com.	—

13. Railway Traffic Administration.—Methods of freight and passenger traffic management. *I*; (3).

Prerequisite: Transportation 12, or credit or concurrent registration in Transportation 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Transportation 13	3		—	11	—	11	—	11	—	210 Com.	Dewsnup

[17. Railway Terminal Management.—Freight and passenger terminals. *I*; (3). (Not given, 1917-18.)

Prerequisite: Transportation 7, or credit or concurrent registration in Transportation 1; Economics 1.]

22. Railway Train Service.—The standard code of train rules; its application to train dispatching; block-signaling practise; time-table construction. An inspection trip to Chicago of four days' duration forms part of this course, Monday to Thursday, inclusive, preceding the Easter recess. Expenses average about \$12.00. *II*; (3).

Prerequisite: Transportation 1, 7, and 13.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Transportation 22	3		—	9	—	9	—	9	—	210 Com.	Dewsnup

- [26. **The Economics of Railway Construction and Maintenance.**—II; (3). (Not given, 1917-18).
Prerequisite: Transportation 1, 7, and 17.]

Courses for Graduates

101. **Railway Rate Policy.**—*Twice a week; I; (1 unit). Time to be arranged.*
 Professor DEWSNUP
102. **The Fiscal Administration of American Railways.**—*Twice a week, II; (1 unit). Time to be arranged.*
 Professor DEWSNUP
- [103. **Foreign Railway Administration.**—*Twice a week; I; (1 unit).* (Not given, 1917-18.)]
- 104b. **Standards of Railway Operation.**—The work of this course requires a cycle of three years for its completion, tho credit will be given for each semester's work. 104a deals with organization and maintenance of standards, 104c with passenger service. *Once a week or, at the option of the instructor, twice a week; II; (1 unit). Time to be arranged.*
 Professor DEWSNUP

ZOOLOGY

HENRY BALDWIN WARD, Ph.D., *Professor*
 JOHN STERLING KINGSLEY, D.Sc., *Professor*
 FRANK SMITH, A.M., *Professor*
 CHARLES ZELNY, Ph.D., *Professor*
 VICTOR ERNEST SHELFORD, Ph.D., *Assistant Professor*
 HARLEY JONES VAN CLEAVE, Ph.D., *Associate*
 —————*Associate*
 ERNEST CARROLL FAUST, Ph.D., *Instructor*
 JOSEPH KRAFKA, JR., M.S., *Research Assistant*
 EZRA CLARENCE HARRAH, A.B., *Research Assistant*
 JESSE ROY CHRISTIE, B.S., *Assistant*
 FLORENCE HAGUE, A.M., *Assistant*
 GERTRUDE MELLEN HOOPER, A.B., *Graduate Assistant*
 LLOYD BLACKWELL DICKEY, A.M., *Graduate Assistant*
 HENRY EDWARD SCHRADIECK, B.S., *Graduate Assistant*
 HARRY LEE ANDREWS, A.B., *Graduate Assistant*

Major: 20 hours from any courses offered in the department, excluding Zoology 1, and including Zoology 3, 4, and 5.

Minors: 20 hours chosen from two or three of the following subjects: animal husbandry (Animal Husbandry 30), bacteriology, botany, chemistry, entomology, physics, physiology, psychology, paleontology, and physiography.

Courses 1 and 2 constitute an introduction to later work in zoology. In the second year, a student may choose as a line of work either morphological, experimental, ecological, faunistic, or systematic courses. The courses on microscopical technic (3), heredity and evolution (5), and current literature (20) are of value for all students. Medical students should take courses 3 and 6 the second year. Those preparing to teach zoology in the high school should take invertebrate morphology (4), field zoology (16, 17), and ecology (9, 11), and a course in general entomology.

Courses for Undergraduates

1. General Zoology.—Animal biology; principles of structure; function, interrelations, origin, and development of animal life; the simpler and best-established generalizations in zoological theory. Lectures; laboratory; quiz work. *I* or *II*; (5).

Subject	No.	Credits	Section	EITHER SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	1	5	Lecture	9	—	9	—	9	—	228 N. H.	Ward
			E,Quiz	—	—	8	—	—	—	249 N. H.	
			F,Quiz	—	—	—	—	8	—	249 N. H.	
			G,Quiz	—	1	—	—	—	—	247 N. H.	
			H,Quiz	—	—	—	1	—	—	— N. H.	Shelford VanCleave and Assistants
			I,Quiz	—	—	8	—	—	—	—	
			J,Quiz	—	1	—	—	—	—	—	
			A,Laboratory	—	8,9	—	8,9	—	8,9	312 N. H.	
			B,Laboratory	10,11	—	10,11	—	10,11	—	312 N. H.	
			C,Laboratory	1,2	—	1,2	—	1,2	—	312 N. H.	
			D ¹ ,Laboratory	—	10,11	—	10,11	—	10,11	312 N. H.	

2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; the early stages of vertebrate embryology; structure of vertebrate tissues; anatomy of systems of organs considered in respect to their function, ontogeny, and evolution in the vertebrate series; anatomical studies of types of the Chordata. Lectures; laboratory; quiz work. *I* or *II*; (5).

Prerequisite: Zoology 1.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	2	5	—	(Arrange)						—	—
			Lecture	10	—	10	—	10	—	228 N. H.	Kingsley and Assistants
			A,Laboratory	8,9	—	8,9	—	8,9	—	330 N. H.	
			B,Laboratory	—	10,11	—	10,11	—	10,11	330 N. H.	
			C,Laboratory	—	1,2,3	—	1,2,3	—	—	330 N. H.	

4. Invertebrate Morphology.—Morphology of a series of invertebrates; invertebrate structure and development; the application of biological principles. Laboratory; lectures; demonstrations. *II*; (3).

Prerequisite: Zoology 1.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	4	3	—	—	1,2,3	—	1,2,3	—	—	310 N. H.	VanCleave

5. Heredity and Evolution.—(a) The facts of heredity and present views regarding them. (b) The proofs of organic evolution with a discussion of the probable factors involved in the process. Lectures; demonstrations; assigned reading. *II*; (2).

Prerequisite: One year of university work.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	5	2	—	—	11	—	11	—	—	228 N. H.	Zeleny

9. Animal Ecology.—The relations of animals to their natural environments. Field and experimental work; lectures on the natural history of mammals, birds, reptiles, and amphibians. *II*; (3).

Prerequisite: One year of zoology or one and one-half years of university work, including Zoology 1.

¹ Will not be opened either semester until after A, B, C have been filled.

Subject	No.	Credits	Section	SECOND SEMESTER—FIRST HALF						Room	Instructor
				M	T	W	T	F	S		
Zoology	9	3	Lecture	9	—	9	—	9	—	310 N. H.	Shelford
Subject	No.	Credits	Section	SECOND SEMESTER—SECOND HALF						Room	Instructor
				M	T	W	T	F	S		
Zoology	9	3	Laboratory	8,9	—	8,9	—	8,9	—	202 V. B.	
			or Field	8,9	—	—	—	—	8-12		

16. Economic Ornithology.—Common birds of the vicinity. Identification; food relations; seasonal distribution; migration activities. Economic importance of birds and of their conservation. Lectures; assigned reading; two field trips per week during April and May in two of the two-hour periods of the following schedule. *II*; (2).

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	16	2	Lecture	—	2	—	2	—	—	228 N. H.	Smith and Assistant
			or Quiz								
			Field Trips	8,9	8,9	8,9	8,9	8,9	8,9		
				3,4	—	3,4	—	3,4	—		

17. Field Zoology.—Collection, preservation, and identification of common representatives of the lower vertebrates and of the various groups of land and fresh-water invertebrates (excluding insects) in the vicinity; identification work on living and preserved material from larger rivers and lakes; observations on the habits and life histories of selected forms. Field and laboratory work; assigned readings. *I*; (4).

Prerequisite: One year in zoology.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	17	4	—	—	8,9	—	8,9	—	8-12	420	Smith and Assistant

Courses for Advanced Undergraduates and Graduates

3. Microscopical Technic and Vertebrate Embryology.—Theory and practise of microscopical technic; vertebrate embryo in early stages of development; methods of fixation, embedding, section cutting, staining, and mounting; preparation of material for use in introductory embryology. Lectures; laboratory. *I*; (3).

Prerequisite: Zoology 1, 2.

Subject	No.	Credits	Section	FIRST SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	3	3	Lecture	—	1	—	1	—	—	229 N. H.	Kingsley
			A, Laboratory	—	2,3	—	2,3	—	—	323 N. H.	
			B, Laboratory	10,11	—	10,11	—	—	—	323 N. H.	

6. Vertebrate Organogeny.—Development of the organs of the vertebrate body. Lectures; assigned readings; laboratory studies on embryos of the chick, dogfish, *Amblystoma*, and pig. (A continuation of Zoology 3.) *II*; (3).

Prerequisite: Zoology 1, 2, 3.

Subject	No.	Credits	Section	SECOND SEMESTER						Room	Instructor
				M	T	W	T	F	S		
Zoology	6	3	Lecture	1	—	—	—	1	—	229 N. H.	Kingsley
			A	2	—	1,2	—	2	—	323 N. H.	
			B	—	1,2	—	1,2	—	—	323 N. H.	

19a-19b. Advanced Ornithology.—(Continuation of Zoology 16.) Systematic and field work; economic and technical literature. *I, II*; (2 to 5).¹ *Time to be arranged.* Professor SMITH

Prerequisite: Zoology 16 or equivalent.

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

Zoology

11. Experimental Ecology and Geography.—The physiology of environmental relations; analysis of behavior. World and regional aspects of behavior and ecology; animal distribution as related to climate and vegetation. *I*; (2 or 4).¹

Prerequisite: One year of zoology and senior standing.

Subject	No.	Credits	FIRST SEMESTER—FIRST HALF							Room	Instructor
			Section	M	T	W	T	F	S		
Zoology	11	2 or 4 ¹	Lecture	—	—	4	—	4	—	247 N. H.	Shelford
			Laboratory	3-4	—	—	3-4	—	—	202 V. B.	
			or Field	—	—	—	—	—	8-3		

FIRST SEMESTER—SECOND HALF												
Lecture	—	4	4	4	4	—	—	—	—	—	247 N. H.	Shelford

18. Advanced Field Zoology.—(A continuation of Zoology 17.) Taxonomic or distributional problems in connection with the local fauna. *II*; (3 to 5).¹

Prerequisite: Zoology 17.

				SECOND SEMESTER								
Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor	
Zoology	18	3 to 5 ¹	—				(Arrange)			420 N. H.	Smith	

25-26. Experimental Zoology.—Experimental embryology; regeneration; heredity; variation; evolution. Laboratory; assigned reading; conference. *I, II*; (5).

Prerequisite: Two years of university work, including one year in zoological courses.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Zoology	25	5	—	(To be arranged)							314 N. H.	Zeleny

				SECOND SEMESTER	
Zoology	26	5	—	Schedule the same as for 25 (first semester).	

22-23. Morphology of Vertebrates.—The skeleton and the brain, the cranial nerves, and the eye and ear. Lectures; laboratory work; dissection of types. *I, II*; (2 to 4).¹

Prerequisite: Zoology 1, 2, 3, and 6.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Zoology	22	2 to 4 ¹	—			(Arrange)					330 N. H.	Kingsley

				SECOND SEMESTER	
Zoology	23	2 to 4 ¹	—	Schedule the same as for 22 (first semester).	

21a-21b. Introduction to Zoological Research.—Morphology, life history, or reciprocal relations of invertebrates, especially parasites of man and other animals. Laboratory; conferences; assigned reading. *I, II*; (2 to 5).¹

Prerequisite: One year in zoological courses, and senior standing.

Subject	No.	Credits	Section	FIRST SEMESTER							Room	Instructor
				M	T	W	T	F	S			
Zoology	21a	2 to 5 ¹	—	(Arrange)							308 N. H.	Ward

				SECOND SEMESTER					
Zoology	21b	2 to 5 ¹		(Arrange)				308 N. H.	Ward

20a-20b. Current Literature.—Presentation and discussion of the results of recent zoological investigation. (Open to all students of zoology; should be taken by those intending to graduate with a thesis.) *I, II*; (1).

Prerequisite: Three years of university work, including one year in zoology.

¹In registering for a course with variable credit hours, a student must put down on his study-list, *not* the possible hours, as shown here, but the number of hours for which *he* intends to take the course; e. g., not 2-5, but 2, or 3, or 4, or 5.

FIRST SEMESTER

Subject	No.	Credits	Section	M	T	W	T	F	S	Room	Instructor
Zoology	20a	1	—	—	—	—	—	3	—	229 N. H.	Zeleny

SECOND SEMESTER

Zoology	20b	1	—	Schedule the same as for 20a (first semester).							
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8a-8b. Senior Thesis.—Individual work on assigned topics. *I, II; (5). Time to be arranged.* Members of the department

Prerequisite: Two years of zoology.

Courses for Graduates

Students entering on graduate study in the department of zoology should have had two years of undergraduate work in the subject. When chosen as a minor the courses listed for graduates and undergraduates must be preceded by at least one full year's undergraduate work in zoology. Work done at other institutions will be evaluated on conference with the head of the department.

102. Vertebrate Morphology.—The origin of vertebrates, the segmentation of the head, and the morphology of special systems. Lectures; required reading. *Twice a week; I; (½ unit). Time to be arranged.* Professor KINGSLEY

[107. Parasitology.—Structure and life history of animal parasites; their relations to disease; origin and biological significance of parasitism. Conferences; assigned readings; demonstrations. *Twice a week; I, II; (1 unit). (Not given, 1917-18.)]*

[109-109a. Physiological Ecology.—The regulatory mechanism of organisms; neutrality, osmotic pressure, immunity, and temperature in relation to natural environments. 109, *twice a week*; 109a, assigned readings and reports. *II; (½ unit each). Time to be arranged. (Not given, 1917-18.)]*

110-110a. Economic Ecology.—Application of principles of physiology and ecology to problems of fisheries and pollution; insect pests and weather; forestry and conservation, etc. 110, *twice a week*; 110a, assigned reading and reports. *II; (½ unit each). Time to be arranged. To be given in 1917-18 and alternate years.*

Assistant Professor SHELFORD

111. Experimental Ecology.—The repetition of published experiments in physiology and ecology. The student selects a topic on animal reactions or on the measurement of osmotic pressure, temperature, acidity, or conductivity, with modern apparatus. *I, II; (½ to 2 units). Time to be arranged.*

Assistant Professor SHELFORD

115. Factors of Individual and Racial Development.—Experimental embryology; regeneration; heredity; variation; evolution. *Twice a week; I, II; (1 unit). Time to be arranged.*

Professor ZELENY

117. Faunistic Zoology.—Taxonomy and distribution, with especial reference to the local fauna; laboratory and field work. *Three times a week; I; (1 unit).*

Professor SMITH

121. Invertebrate Morphology and Parasitology.—Individual research course. *I, II; (1 to 2 units). Time to be arranged.*

Professor WARD

122. Vertebrate Morphology.—Individual research course. *I, II; (1 to 2 units). Time to be arranged.*

Professor KINGSLEY

123. Faunistic and Systematic Zoology.—Individual research course. *I, II; (1 to 2 units). Time to be arranged.*

Professor SMITH

Zoology

124. Experimental Zoology.—Individual research course. *I, II; (1 to 2 units).*
Time to be arranged. Professor ZELENY

125. Animal Ecology and Behavior.—Individual research course. *I, II. Time and credit to be arranged.* Assistant Professor SHELFORD

127. Theories of Animal Phylogeny.—Relations of various groups of animals; signification of so-called intermediate forms; study of invertebrate larval forms and of theories of descent based on them. Lectures; assigned readings; demonstrations. *Once or twice a week; I, II; (1 unit).* To be given in 1917-18 and alternate years.
Professor WARD

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